

5. DoD Counterproliferation Programs

In the subsections that follow, DoD activities and programs strongly related to counterproliferation are discussed. Section 5.1 is devoted to a discussion of the various activities and key developments affecting DoD's overall Counterproliferation Initiative, including new DoD initiatives, the activities of the Counterproliferation Council, the CINCs' counterproliferation required capabilities and Joint Staff counterproliferation-related activities, a summary of the 1996 DoD Counterproliferation Study, and an update on the current activities of the Counterproliferation Support Program. DoD activity and program descriptions are provided in Sections 5.2 - 5.7 and organized in terms of the counterproliferation functional areas of proliferation prevention, strategic and tactical intelligence, battlefield surveillance, NBC/M counterforce, active defense, and passive defense. This year, DoD programs associated with countering paramilitary and terrorist NBC threats are discussed in Section 8, together with DOE and U.S. Intelligence programs in this area. In Sections 5.2 - 5.7, key program accomplishments and milestones are summarized, and FY 1998 budgetary data is provided. Additional programmatic details are provided in Appendix C. Finally, Section 5.8 summarizes how the accomplishments of DoD activities and programs directly address the counterproliferation ACEs.

5.1 Introduction and New Developments

Policy and Strategy Objectives. U.S. armed forces must be fully prepared to counter the military threats posed by NBC/M. Senior DoD officials continue to take an active role in guiding the implementation of DoD's Counterproliferation Initiative. As a result, the Department is making substantial progress toward fully integrating the counterproliferation mission into its military planning, acquisition, intelligence, and international cooperation activities. These efforts have been built upon the formal policy guidance issued by the Secretary of Defense in May 1994, follow-on guidance contained in internal planning and programming documents, and a DoD Directive on Counterproliferation issued in July 1996. This Directive delineates specific responsibilities, formalizes relationships among DoD organizations, and establishes common terms of reference. These documents reflect DoD's role across the entire spectrum of U.S. Government activities to counter NBC/M proliferation – from supporting diplomatic efforts to preventing and containing proliferation, to protecting the U.S. and its friends and allies and their military forces from NBC weapon attacks.

DoD policy to counter proliferation underlies strengthened efforts to prevent proliferation and to protect U.S. forces, interests, and allies in the face of proliferation where it occurs. It applies to the development of requisite U.S. military capabilities and requires U.S. forces to be prepared to execute offensive and defensive military operations to counter the deployment and employment of NBC/M. The major objectives of DoD policy are:

- Support overall U.S. Government efforts to ***prevent*** the acquisition of NBC weapons and their associated delivery systems;
- Support overall U.S. Government efforts to ***roll back*** proliferation where it has occurred;

- **Deter** and **prevent** the effective use of NBC/M against the U.S., its allies, and U.S. and allied forces; and
- **Adapt** U.S. military forces, and their associated planning, doctrine, and training, to operate effectively when confronted with the presence, threatened use, or actual use of NBC/M.

To achieve these counterproliferation policy objectives, U.S. forces must possess a broad spectrum of capabilities. R&D and acquisition programs and other DoD activities designed to bring these capabilities to fruition are described in Sections 5.2 through 5.8 below and in Section 8.

5.1.1 DoD's Counterproliferation Initiative. DoD's Counterproliferation Initiative is the Department-wide effort to meet the challenges posed by the proliferation of NBC/M. It was established to ensure that U.S. forces are prepared to conduct successful military operations in an NBC environment. DoD, through its Counterproliferation Initiative, will invest nearly \$4.9 billion in FY 1998 in programs strongly related to counterproliferation, up more than 14% from the FY 1997 investment of almost \$4.3 billion.

Activities of the CP Council. To ensure that DoD's broad counterproliferation policy objectives are met and that the implementation of the Counterproliferation Initiative is integrated and focused, DoD's Counterproliferation Council (i.e., the "CP Council") was established by the Secretary of Defense in April 1996. The CP Council is chaired by the Deputy Secretary of Defense and composed of the USD(A&T), the Under Secretary of Defense for Policy, the Vice Chairman of the Joint Chiefs of Staff, the Under Secretaries of the Military Departments, the Vice Chiefs of the Military Services, the Assistant Secretary of Defense for International Security Policy (ASD(ISP)), the Assistant Secretary of Defense for Command, Control, Communications, and Intelligence (ASD(C3I)), the ATSD(NCB), and the Director for Strategic Plans and Policy of the Joint Staff. Through the complementary themes of "institutionalizing" and "internationalizing," the CP Council monitors departmental progress in developing the strategy, doctrine, and force planning necessary to execute counterproliferation objectives effectively. It also monitors DoD-wide efforts at training, exercising, and equipping U.S. forces for the counterproliferation mission, as well as overseeing DoD counterproliferation activities in interagency and international fora.

The CP Council meets on a regular basis, focusing on the potential impact of NBC/M proliferation on the Department's ability to fight two nearly simultaneous major regional contingencies, as well as on Joint and individual Service doctrine, training, and exercising for integrated operations in an NBC environment. In this connection, the CP Council identified the importance of understanding the likely NBC employment concepts of proliferants, and took steps to ensure that focused intelligence assessments would be used to develop U.S. regional military plans (as well as doctrine and exercise policies) to counter them. The CP Council will continue to address specific issues within the broad areas of adversary use concepts, counterproliferation doctrine, training and exercising, and related issues.

5.1.2 CINC Counterproliferation Priorities and Planning Activities. DoD's counterproliferation responsibilities include the application of military force, when necessary. Deriving the CINCs' formal warfighting plans follows a deliberate and formalized "national

objective-to-task” process that proceeds from top-level Presidential guidance and instructions down to specific military operational plans and activities. The National Security Strategy, Presidential Decision Directive-13, and the Counterproliferation Policy Guidance of the Secretary of Defense have already provided the framework for counterproliferation planning. Three Joint documents that have evolved from these broad guidance documents are the *Missions and Functions Study*, the *Counterproliferation Charter*, and the CJCS’s *Counterproliferation 0400 CONPLAN* (concept plan). These are the key documents that serve as the prerequisites for beginning the CINCs’ formal planning process to execute U.S. counterproliferation policy.

Because the challenges of counterproliferation involve new policy considerations, the *Missions and Functions Study* was a special effort chartered by the Secretary of Defense and aimed at facilitating future DoD counterproliferation planning. The study was a combined effort by the Joint Staff, Services, CINC representatives, and OSD. Its key findings were: i) each geographic CINC would be responsible for executing U.S. counterproliferation policy within his area of responsibility (AOR); and ii) implementation of counterproliferation policy within each AOR would be executed via each CINC’s standard deliberate planning process. This planning process included the development of the overarching CJCS’s *Counterproliferation 0400 CONPLAN*, prior to each CINC developing an AOR-specific counterproliferation CONPLAN.

The findings of the *Missions and Functions Study* were approved by the Secretary of Defense in May 1995, and he further directed that a *Counterproliferation Charter* be written prior to the development of the CJCS’s *Counterproliferation 0400 CONPLAN*. The *Counterproliferation Charter* was developed as a supplement to the top-level guidance documents delineated above, providing more of a military focus with respect to the counterproliferation mission. The *Counterproliferation Charter* has been approved by the CJCS and the Secretary of Defense. The CJCS’s *Counterproliferation 0400 CONPLAN* further defines national level counterproliferation policy and guidance in terms of three national counterproliferation operational objectives and six counterproliferation operational tasks. These national counterproliferation operational objectives and tasks evolved from an in-depth analysis of the intentions of multiple top-level U.S. policy documents relevant to the counterproliferation mission. The ensuing objectives and tasks have been fully coordinated throughout the Commands and within OSD. These counterproliferation operational objectives and tasks will guide the CINCs through the development of their AOR-specific CONPLANs. The CJCS’s *Counterproliferation 0400 CONPLAN* was coordinated in the Joint Staff and was then given to the CINCs so that they could initiate their own AOR-specific counterproliferation planning. The reader is referred to the *Counterproliferation 0400 CONPLAN* for additional details.

The CINCs’ Counterproliferation Required Capabilities. The current CINCs’ listing of 16 counterproliferation required capabilities, considered necessary to conduct the counterproliferation mission from a military warfighting perspective, was developed by the Joint Staff’s Deterrence/Counterproliferation JWCA team, approved by the Joint Requirements Oversight Council (JROC), and endorsed by the CINCs in 1996. The prioritized list evolved from a series of Operational Planning Workshops (OPWs) with each of the CINCs. The workshops reviewed national objectives which support the U.S. national goal of countering proliferation. Deterrence/Counterproliferation operational tasks and required military capabilities were identified, validated, and prioritized from the CINC perspective of supporting the CJCS’s

Counterproliferation 0400 CONPLAN. The CINCs generally put the highest priority on those areas where the most leverage could be exercised for getting enhanced capabilities out to the field quickly. Table 5.1 lists the CINCs' required counterproliferation capabilities. It also illustrates the evolution of the current required capabilities from the CINCs' original counterproliferation priorities established by the Deterrence/Counterproliferation JWCA and approved by the JROC in 1994 (and reaffirmed annually). This evolution reflects the CINCs' need for improved capabilities and technologies to support timely counterproliferation-related intelligence, conventional counterforce response with minimal collateral effects, and the activities of SOF in countering paramilitary and terrorist threats. The CINCs' counterproliferation required capabilities were reviewed by the CPKC and served as a basis for the review and revision of the counterproliferation ACEs. In general, the top priority ACEs track the top priority CINC-required counterproliferation capabilities. There are, however, some differences owing to the broader perspective of the interdepartmental CPKC and because the CPKC ACEs focus on capability *shortfalls* whereas the CINCs focus on capability *requirements*. This comparison is also summarized in Table 5.1.

Table 5.1: Evolving CINC Counterproliferation Priorities and Required Capabilities

1996 CINC Counterproliferation Priorities		1997 CINC Counterproliferation Required Capabilities	Corres. ACE*
1. Detection and characterization of BW and CW agents	CINC OPWs	1. CP intelligence cycle	8
2. Intercept cruise missiles		2. Conventional response with minimal collateral effects	2, 3
3. Defeat underground targets		3. SOF response and intelligence collection/analysis targeting covert/paramilitary/terrorist threats	5, 6
4. Characterization and identification of underground targets		4. Battlefield NBC detection and warning	1
5. Collect and analyze intelligence		5. Theater missile defense with minimum collateral effects	4
6. Passive defense enabling operations		6. Defeat underground targets	3
7. Support for operations in an NBC environment		7. Target planning/analysis including collateral effects prediction and post-strike assessment	11
8. Production of BW agent vaccines		8. Individual protection	9
9. Planning and targeting for above ground infrastructure		9. Proliferation pathway analysis	13
10. BW/CW agent defeat		10. Cruise missile and aircraft defense with minimum collateral effects	7
11. Detection and tracking of shipments		11. Collective protection	9
12. Prompt mobile target kill		12. Mobile target defeat	12
13. Support for Special Operations Forces		13. Offensive information warfare	-
14. Locate, detect, and disarm WMD in CONUS and OCONUS		14. CP consequences logistics capability	9
		15. Decontamination	9
		16. NBC medical treatments	9, 10

* DoD ACE Prioritization

5.1.3 Key Counterproliferation Studies and Analyses. Two studies, completed in 1996 and addressing military operations in NBC contaminated environments, are having a significant impact on counterproliferation planning. They are described in this subsection.

The 1996 DoD Counterproliferation Study. Last year, during the FY 1997 - 2001 DoD budget review, a detailed assessment of all counterproliferation-related programs was conducted. The assessment addressed programmatic alternatives and priorities, policy impacts, CINC requirements, and management alternatives. The goal of the Counterproliferation Study was to provide senior DoD leadership with quantitative estimates of returns on counterproliferation investments over the FY 1998 - 2003 Future Years Defense Plan (FYDP) in support of this assessment. The study was conducted under the auspices of OSD's Director for Program Analysis and Evaluation (PA&E), with participation by ATSD(NCB)'s Deputy for Counterproliferation (DATSD(NCB)(CP)), ASD(SO/LIC), ASD(ISP), ASD(Strategy and Requirements), the Services, Joint Staff, Ballistic Missile Defense Organization (BMDO), Defense Special Weapons Agency (DSWA), and Defense Intelligence Agency (DIA). It was completed in the summer of 1996.

The study reviewed R&D and acquisition programs strongly related to counterproliferation to identify applicable U.S. capabilities and technologies and employed validated NBC/M threats and conflict scenarios. These building blocks, together with the CINCs' updated counterproliferation required capabilities, led to the formulation of programmatic alternatives. To meet study time lines, the study did not employ full-scale military campaign models, but, instead, employed simpler models, results from previous authoritative studies, reasonable interpolations and extrapolations of their results, and expert judgment to perform first order cost-benefit analyses of NBC passive defense programs. Synergies between NBC passive defense, ballistic missile active defense, and NBC/M counterforce operations were also identified. Three scenarios involving NBC/M were addressed: i) a Major Regional Contingency in North-East Asia; ii) conventional counterforce operations against a rogue nation's NBC/M infrastructure; and iii) terrorist attacks using CW/BW, with and without prior warning.

Major Regional Contingency. This scenario, an extrapolation of BMDO's "Capstone" Cost and Operational Effectiveness Assessment (COEA), involves an intense conflict initiated by the Democratic People's Republic of (North) Korea (DPRK) against the Republic of (South) Korea (ROK) and its U.S. allies. Four tractable NBC/M-related "vignettes" were defined to capture the essential features of the conflict and illuminate counterproliferation-related programmatic options. One vignette deals with the capability of U.S. ground forces to prevail against CW-armed rocket and standoff BW attacks. Two other vignettes focus on U.S. capabilities to sustain air base and seaport operations in the face of CW-armed theater ballistic missile attacks and BW attacks by covert DPRK infiltrators. The fourth vignette addresses collateral effects on civilians arising from DPRK NBC attacks on nearby ROK military targets.

The interplay among active defense, counterforce operations, and passive defense strongly influences achievable air base sortie rates and the operational status of port facilities. Early in the conflict, an effective active defense helps establish air superiority by reducing the ballistic missile delivered CW threat to air bases, thereby enabling high sustained sortie rates. Air superiority is a key prerequisite for successful counterforce operations against mobile rocket and missile launchers,

and attrition of these launchers further reduces CW threats to both air bases and port facilities. This attrition also places less stress on stocks of passive defense materiel for individual and collective protection, decontamination, and medical treatment. The synergistic roles of active defense, counterforce operations, and passive defense in “thinning the threat” is depicted in Figure 5.1. Timely detection and early warning of CW/BW agents greatly reduces U.S. casualties by allowing military personnel to quickly don individual protective gear. Modern NBC protective equipment greatly improves the effectiveness of U.S. forces and their ability to sustain high aircraft sortie rates. To maintain nominal port operations, passive defense measures must also be available to those essential civilian workers primarily responsible for unloading and transporting cargo. Moreover, it must be noted that NBC attacks, particularly BW attacks, could have devastating collateral effects on nearby population centers, and that, consequently, the host nation (possibly assisted by the U.S.), should plan for timely detection, early warning, and protection measures for its civilian population.

U.S. Strike Against a Rogue Nation’s NBC/M Infrastructure. The capability to destroy or disrupt an adversary’s NBC/M infrastructure – and to do so with minimal collateral effects – is a top priority of the CINCs. NBC/M infrastructure targets in five rogue nations, organized by function (nuclear, biological, or chemical production or storage facilities) and hardness (aboveground soft or hard, shallow underground, deeply buried, and tunneled), were reviewed by a DSWA-convened panel of weapon and weapons effects experts to evaluate current and projected counterforce capabilities against these targets. They concluded that current capabilities to hold NBC/M infrastructure targets at risk significantly limit CINC counterforce options. In particular,

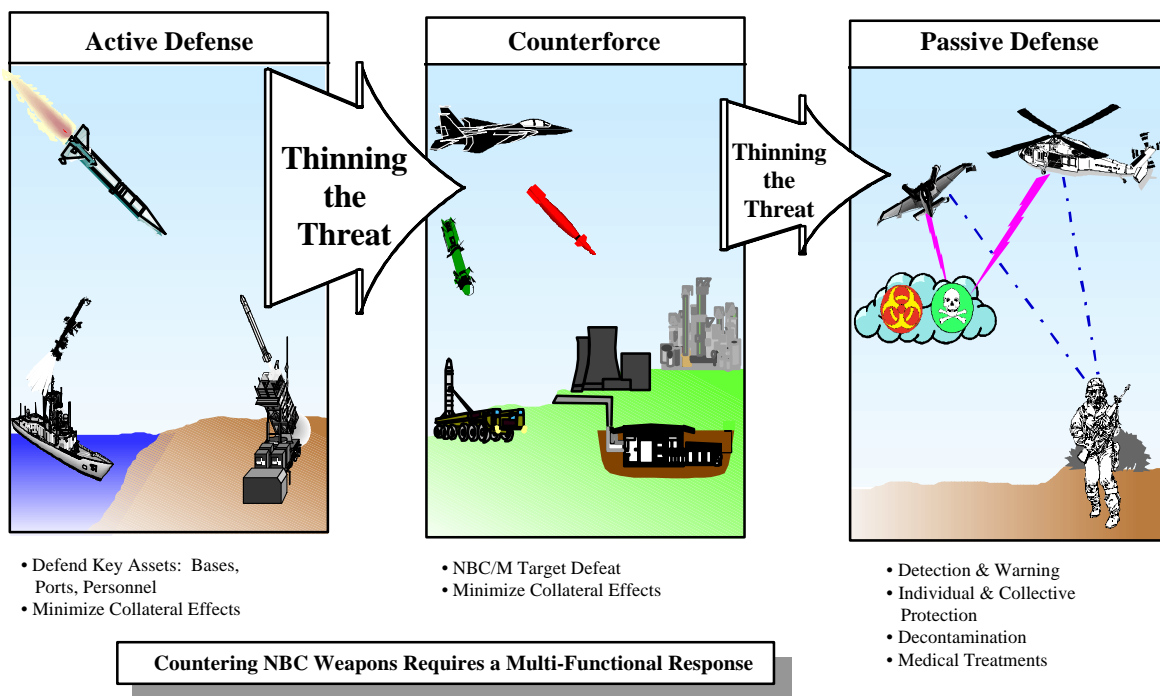


Figure 5.1 Interrelated Roles of Active Defense, Counterforce, and Passive Defense: Thinning the Threat

the more hardened targets could not be defeated reliably, and collateral effects could not be predicted or controlled with confidence. The ongoing and follow-on Counterproliferation ACTDs are addressing these shortfalls and will significantly expand CINC counterforce options. However, shortfalls will remain in placing deeply buried and tunneled targets at risk.

Terrorist CW/BW Attack. Two scenarios were evaluated: i) a surprise CW/BW attack on a U.S. asset amidst a population indigenous to the terrorists, and ii) a BW attack announced in advance during a civil event within a population foreign to the terrorists. In the surprise attack, terrorists targeted an air base supporting U.S. military activities in a foreign country with a sufficient quantity of CW or BW agents to provide a lethal dose to base personnel while minimizing the risk of exposure to the surrounding population. CW/BW agent detectors could be used to direct appropriate and timely medical treatment, and improved collective protection, such as better building filtration, would reduce casualties for personnel remaining indoors. In the scenario with prior warning, the terrorists, equipped with BW dispensers each containing a few kilograms of anthrax, take up multiple positions around a major European city in order to threaten as many people as possible. Their dispersed posture makes counterterrorism actions difficult. It was estimated that U.S. SOF troops at current readiness levels could simultaneously neutralize several of the BW dispensers and/or bands of terrorists with high confidence, provided their locations were known or could be found quickly.

General Conclusions of the Study. DoD's investments in passive defense have direct and positive impacts on the effectiveness of ground forces in CW and BW contaminated environments. Additionally, if both active defense and counterforce operations are highly effective, air base and port facility operations are sustainable; however, civilian port workers must be supplied with some measure of CW/BW attack warning and individual protection. The Counterproliferation ACTDs will provide the CINCs with more options for defeating fixed NBC/M infrastructure targets while minimizing collateral effects. A remaining, long-term shortfall is still projected in U.S. capabilities to defeat deeply buried and tunneled targets. CW/BW detection and agent neutralization technologies can be used or adapted to counter terrorist use of these weapons. In concert with local law enforcement and intelligence authorities, better NBC-related consequence management planning, integration, and exercise support would fill some gaps in counterterrorism capabilities. Finally, the net impact of the study was an increase of \$225 million in the FY 1998 -2003 FYDP for: i) BW detection and warning equipment (in particular, the NBC Joint Warning and Reporting Network (JWARN), the Joint Biological Point Detection System (JBPDS), and JBREWS); ii) equipment to enhance the NBC target defeat and counterterrorism capabilities of the U.S. Special Operations Command (USSOCOM); and iii) equipment to improve DoD's consequence management capabilities.

The Effects of Chemical and Biological Warfare on Air Base Combat Operations. This comprehensive study completed by the Air Force assessed the impact of CW and BW attacks on forward air base operations by surveying the Service's institutional knowledge, reviewing previous technical assessments and studies, conducting a field exercise, and examining training programs. The study pointed out the need for improvements in individual and collective protection, new training standards, automated detectors, base-level contamination assessment models, and education for senior leadership on operations in contaminated environments. It also indicated a need for greater research and analysis, realistic field exercises, and the development of new policies

and procedures for sustaining operations in a CW/BW contaminated environment. This study led to the creation of the “Air Force NBC Ability-to-Survive-and-Operate” Integrated Process Team (IPT) to oversee passive defense activities in coordination with the Air Force’s overarching Counterproliferation IPT (see section 5.1.5 below).

5.1.4 The Counterproliferation Support Program. At the heart of DoD’s Counterproliferation Initiative is the Counterproliferation Support Program which seeks to leverage ongoing R&D and acquisition activities to expedite the fielding of enhanced capabilities to counter NBC/M threats. The Counterproliferation Support Program was established by the Deputy Secretary of Defense in August 1994 to address key shortfalls in counterproliferation capabilities identified by the NPRC. The ATSD(NCB) and his Deputy for Counterproliferation were tasked with implementing the program, doing so in close consultation and coordination with the NPRC/CPRC, the Joint Staff and JROC, the CINCs, the Services, DoD Agencies, and cognizant components of OSD. This cooperation is ongoing and continuing.

Mission of the Deputy for Counterproliferation. ATSD(NCB) and his Deputy for Counterproliferation serve as the central point of contact for DoD counterproliferation R&D and acquisition programs and are responsible for managing the Counterproliferation Support Program. DATSD(NCB)(CP)’s mission is to: i) provide management oversight for DoD’s Counterproliferation Initiative to ensure it fully supports the President’s policy to limit the spread of and contain the threat from NBC/M; ii) manage the Counterproliferation Support Program; and iii) ensure coordination of DoD counterproliferation R&D and acquisition efforts with DOE, U.S. Intelligence, and other federal agencies. Oversight of the Counterproliferation Initiative is accomplished by: i) participating in Program Objective Memorandum (POM) and Programming, Planning and Budgeting System reviews, Departmental planning and policy development, and acquisition oversight activities; ii) serving as facilitator across individual program boundaries; and iii) interacting with the Joint Staff, JROC, the Deterrence/Counterproliferation JWCA, and the CINCs to ensure that their counterproliferation priorities are adequately addressed. In its role as interagency integrator and coordinator of programs related to counterproliferation, the Deputy for Counterproliferation seeks to maximize the payoff from the national investment in counterproliferation-related activities, facilitate interactions between the DoD R&D and acquisition communities and other U.S. Government agencies, and identify non-DoD programs to meet CINC and other DoD user needs.

Counterproliferation Mission Statement

The mission of the Counterproliferation Office is to advocate, focus, and accelerate acquisition capabilities to ***prevent*** proliferation of weapons of mass destruction and to ***prevail*** decisively when confronted with their use.

The Counterproliferation Mission Statement reflects the goal of the Counterproliferation Support Program, whose purpose is to improve specific military counterproliferation capabilities by: i) building on ongoing programs in the Services, DoD Agencies, DOE, and U.S. Intelligence; ii) focusing on the most critical counterproliferation shortfalls to address major gaps in deployed

capabilities (as reflected in the CINC required capabilities and the ACEs); iii) leveraging existing program funding to more rapidly field capabilities by accelerating the deliverables of DoD programs (i.e., seek the 70% solution, leave the 100% solution to longer term R&D); iv) identifying and enhancing the development of high payoff technologies to accelerate capabilities to the warfighter; v) identifying and promoting key non-materiel initiatives which complement technological advances; and vi) transitioning Counterproliferation Support Program projects to the Services as soon as practicable. By leveraging existing sponsor funding and funding efforts with a strong and high level military component or CINC support, the Counterproliferation Support Program can expedite the transition of project development and acquisition responsibilities to the Services. The expedited acquisition process embodied in the ACTD process is ideal for achieving these objectives, and the Counterproliferation Support Program seeks to use ACTDs as the vehicle for rapid evaluation, demonstration, and fielding of new and enhanced military capabilities.

The Counterproliferation Support Program budget request for FY 1998 is \$104.7 million, up from the \$93.7 million received for FY 1997. This year, the Counterproliferation Support Program is focusing its investments in 8 of the 15 counterproliferation ACEs, as shown in Table 5.2. Nearly 80% of its FY 1998 budget is allocated in the areas of remote detection, characterization, and early warning of BW agents (DoD ACE priority 1) and detection and defeat of NBC/M and underground facilities with minimal collateral effects (DoD ACE priorities 2 and 3). For FY 1998, the Counterproliferation Support Program budget represents approximately 2% of DoD's total investment in counterproliferation. Table 5.2 also compares Counterproliferation Support Program funding with the overall DoD investment in counterproliferation. By focusing its budget on high payoff areas and leveraging existing programs by adding funding to accelerate project schedules and deliverables, enhancements in counterproliferation capabilities are being achieved in the near term, and, by the end of the decade, significant advancements in operational capabilities in most of the counterproliferation ACEs will be achieved.

New Project Starts and Management/Oversight Accomplishments. New project starts in FY 1997 implemented since last year's CPRC report include: i) the follow-on Counterproliferation Counterforce ("CP2") ACTD; ii) the JBREWS ACTD for early warning of BW attack; iii) the Consequence Management "911-BIO" ACTD; and iv) the Cooperative Army/Navy Hard Target Tactical Missile System for hard and underground target defeat. These projects are described in more detail in the subsections that follow. Key management/oversight accomplishments of the Counterproliferation Support Program include: i) providing technical direction for the 1996 Counterproliferation Study; ii) working with the Joint Staff (Force Structure, Resources, and Assessments, J-8) Warfighting Analysis Division to improve their NBC weapons technical analysis capabilities; iii) working closely with ASD(SO/LIC) and USSOCOM to adapt technologies for specialized SOF use; iv) signing a Memorandum of Understanding (MoU) between ATSD(NCB) and the DIA/CMO for improving interagency cooperation in unattended ground sensor R&D; v) coordinating efforts to establish a cooperative DoD/U.S. Customs Service program to improve efforts to stem NBC proliferation from FSU states, Eastern Europe, and the Baltics; and vi) establishing a counterproliferation website as part of DoD's ACQWeb website.

Counterproliferation On-Line: The "CP WebSite". In late 1996, DATSD(NCB)(CP) began to explore the development of an internet presence in an effort to be more timely and responsive in making information on current and planned activities and programs appropriate for

Table 5.2: Counterproliferation Support Program ACE Investments

Counterproliferation ACEs (in DoD priority order)	FY 1998 Investments [\$M]	
	DoD CP Initiative	CPSP ^a
1. Detection, Identification, and Characterization of BW Agents	191.1	41.0
2. Detection, Characterization, and Defeat of NBC/M Facilities with Minimal Collateral Effects	83.8	41.3
3. Detection, Characterization, and Defeat of Underground Facilities with Minimal Collateral Effects		
4. Theater Ballistic Missile Active Defense	3,217.5	-
5. Support for Special Operations Forces and Defense Against Paramilitary, Covert Delivery, and Terrorist NBC Threats	151.1	13.1
6. Provide Consequence Management	21.5	1.3
7. Cruise Missile Defense	18.1	-
8. Collection, Analysis, and Dissemination of Actionable Intelligence to Counter Proliferation	0.8 ^b	-
9. Robust Passive Defense to Enable Sustained Operations on the NBC Battlefield	364.9	1.0
10. BW Vaccine RDT&E and Production to Ensure Stockpile Availability	64.5	-
11. Target Planning for NBC Targets	5.7	5.7
12. Prompt Mobile Target Detection and Defeat	178.0	-
13. Detection, Tracking, and Protection of NBC/M and NBC/M-Related Materials and Components	3.0	1.3
14. Support Export Control Activities of the U.S. Government	16.2	-
15. Support Inspection and Monitoring Activities of Arms Control Agreements and Regimes	569.9	-
^a Includes project integration/oversight support. ^b Please see the Intelligence Annex to this report for additional information.		
• TOTALS:		\$4,886.1 \$104.7

public release more readily available. This internet presence was unveiled in February 1997 as the “CP WebSite”, located on the OSD Acquisition and Technology ACQWeb (or addressable directly at <http://www.acq.osd.mil/cp>). The main purpose of the CP WebSite is to disseminate information to U.S. taxpayers, Congress, and the press; but this information is also available to users worldwide. Choosing ACQWeb as the CP WebSite’s host allowed the site’s web spinners to leverage OSD’s existing information review, dissemination, and security vehicles to meet changing consumer demands for information. Thus far, the CP WebSite is being accessed more than 1,000 times per week by users from within the U.S. and abroad. Users from outside the U.S. include Russia, Ukraine, China, the European and Scandinavian countries, Canada, Japan, South Korea, Australia, and Indonesia. The CP WebSite currently offers an ODATSD(NCB)(CP) Staff Directory, an online version of the 1996 CPRC report to Congress, a large collection of links to government and other counterproliferation-related websites, and a series of links to searchable archives for government and congressional records and relevant articles appearing in the mainstream press. Planned additions to the CP WebSite for 1997 include: i) summaries of projects supported by the Counterproliferation Support Program, ii) an area for commentary from the

DATSD(NCB)(CP) on issues of current concern, iii) addition of a topically ordered index, and iv) layout and graphic enhancements to make the site more user-friendly.

5.1.5 Other Key Activities Associated with DoD's Counterproliferation Initiative.

Several other activities and developments impacting DoD's Counterproliferation Initiative have occurred since the CPRC's May 1996 report. They are discussed below.

International Cooperative Efforts to Counter Proliferation. DoD is continuing to work with long-standing allies in Europe and the Pacific region to develop common approaches for countering proliferation. DoD played the leading role in moving counterproliferation to the top of NATO's agenda. NATO's Senior Defense Group on Proliferation (DGP), co-chaired by the United States and a European ally (currently Italy), was established in 1994 to determine the range of alliance and national capabilities required to address NBC/M proliferation risks and recommend improvements in NATO's defense posture to counter these threats. NATO's counterproliferation initiative is an integral part of the alliance's adaptation to the post-Cold War strategic environment. As part of NATO's strategic reorientation toward greater security responsibilities beyond Europe, the DGP has recommended improvements in NBC protection of deployed allied forces operating beyond NATO's periphery where the military dangers posed by NBC/M proliferation are greatest. The DGP has also recommended steps to ensure NATO development of needed defenses against BW threats, which are of particular concern. In June 1996, the DGP presented its recommendations to NATO defense and foreign ministers, stressing the importance of developing a core, integrated set of capability enhancements and force improvements. In many of these areas, NATO already has, or is on the way to developing, the requisite capabilities. DGP findings are intended to give impetus and an added rationale for fielding such capabilities, as well as to demonstrate how supplementing this nucleus of capabilities with other means – including layered defenses against theater ballistic missile attack, special munitions for NBC agent defeat and hardened NBC targets, computer modeling and simulation, and medical countermeasures – would strengthen the alliance's overall ability to discourage NBC proliferation, deter the threat or use of NBC weapons, and protect against NBC attacks.

In the Pacific and Middle East regions, U.S. friends and allies have also recognized the growing security risks posed by proliferation. DoD has collective defense arrangements with many nations in the Pacific region and conducts combined operations with their militaries. For example, DoD has established a regular dialogue with Australia to forge common approaches to improving military capabilities in the face of NBC risks. DoD is also planning to initiate a dialogue with South Korea on these issues, and a counterproliferation seminar will be conducted with Japan this summer. In the Middle East and Persian Gulf regions, DoD has held discussions with longtime friends and allies on NBC defense preparedness. A counterproliferation working group with Israel has been established to discuss common approaches to NBC/M threats. Discussions have also been held with Kuwait, and in the near future these bilateral discussions will be expanded to include other U.S. friends and potential coalition partners in the region. These international activities demonstrate that the U.S. is not alone in its concerns for the defense dimension of NBC/M proliferation. DoD remains committed to building international partnerships with allies and friends whose security and national interests are threatened by NBC/M proliferation.

The Air Force Counterproliferation Integrated Process Team (CIPT). The Air Force has established the CIPT to plan and coordinate all Air Force efforts dealing with the challenges of NBC warfare. The CIPT is preparing an Air Force Counterproliferation Master Plan to coordinate Air Force counterproliferation activities and is implementing the recommendations of the Air Force's study on "The Effects of Chemical and Biological Warfare on Air Base Combat Operations" described above. The CIPT is organized around six counterproliferation-related functional areas: command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR); nonproliferation/deterrence; theater air campaign/counterforce/active defense; air base operability; force protection; and requirements/acquisition.

Science and Technology Strategic Planning for Counterproliferation. The 1997 *Joint Warfighting Science and Technology Plan (JWSTP)* provides a Joint science and technology (S&T) perspective across the Services and Defense Agencies for the purpose of assuring that the DoD S&T program adequately supports high-priority Joint Warfighting Capability Objectives (JWCs). While these JWCs are not all inclusive, they are validated by the JROC as being important to CINC mission needs. The JWSTP emphasizes Advanced Technology Demonstrations (ATDs) and ACTDs that transition innovative concepts and mature technologies to the warfighter faster and more cost effectively than traditional acquisition mechanisms. "Chemical/Biological Warfare Defense" and "Countering WMD" are two of the ten JWCs addressed in the 1997 JWSTP. The JWSTP also highlights technology development efforts in the areas of NBC contamination avoidance, point detection, early warning, individual and collective protection, and decontamination. Counterproliferation-related ATDs and ACTDs in the areas of NBC passive defense and counterforce are also described in the JWSTP. The 1997 JWSTP and JWC-supportive elements of the DoD S&T program continue to receive funding priority in the President's Budget and the FYDP.

5.2 Status and Accomplishments of DoD Proliferation Prevention Programs

5.2.1 Relevant Counterproliferation ACEs and DoD Policy Perspectives for Proliferation Prevention. DoD's role in proliferation prevention involves working with U.S. Intelligence to identify candidate proliferants before they can acquire or expand their NBC/M capabilities (DoD ACE priorities 8 and 13); supporting U.S. Government export control activities (DoD ACE priority 14); providing inspection, monitoring, implementation, and verification support for arms control treaties and regimes (DoD ACE priority 15); and, if so directed by the National Command Authority, planning and conducting interdiction missions to thwart proliferation activities (DoD ACE priorities 2, 3, 5, and 11).

5.2.2 New DoD Initiatives in Proliferation Prevention. The DoD/U.S. Customs Service Cooperative Program is a new start for FY 1997.

DoD/U.S. Customs Cooperative Program. In the FY 1997 NDAA (Section 1424), Congress authorized DoD, in cooperation with the U.S. Customs Service, to develop and implement a training and technical assistance program to assist border enforcement authorities in the states of the FSU, Eastern Europe, and the Baltic states in preventing the proliferation of NBC/M and related materials. The principal objectives of this program are to: i) assist in the

establishment of a professional cadre of border enforcement personnel trained to detect, identify, interdict, and investigate all aspects of smuggling and trafficking related to NBC weapons, components, dual-use items, and delivery systems; and ii) deliver technical assistance to enhance and improve the ability of these countries to interdict materials of concern. Initial country assessments are followed up with in-country training programs. The first countries to receive training (starting in late FY 1997) will be Romania, Moldova, Bulgaria, and Slovenia. These countries already have undergone customs related assessments as part of other programs. The On-Site Inspection Agency (OSIA) is the executive agent for the program and will be responsible for its day-to-day operations and for leading the country assessment and training teams. Additional project details are provided in Table 5.3 and in Appendix C (Table C.9).

5.2.3 Counterproliferation Support Program Projects in Proliferation Prevention.

Counterproliferation Support Program projects in proliferation prevention include: i) development, deployment, and transition to the Navy of the Specific Emitter Identification (SEI) system; ii) a joint DoD/FBI project to adapt DoD technologies, techniques, and training to enhance the capabilities of foreign law enforcement authorities to prevent NBC/M proliferation at its source; iii) Integrated Proliferation Prevention and Open Source Monitoring activities; and iv) support for the activities of ATSD(NCB)'s Deputy for Nuclear Matters. The status of these projects is summarized below and additional details are provided in Table 5.3 and in Appendix C (Table C.1 and Table C.4 for the SEI system).

The Counterproliferation Support Program, in partnership with the Navy, has been successful in deploying the SEI prototype system to improve capabilities to identify and facilitate the tracking of ships at sea suspected of transporting NBC/M and related materials. Deployment of the SEI system began in April 1995, six months ahead of schedule, and currently 32 units are deployed. The project transitions to the Navy in FY 1998, and no additional Counterproliferation Support Program funds are budgeted for this project after FY 1997. The Navy intends to continue SEI system procurement by upgrading existing deployed systems to the SEI configuration (see subsection 5.2.4).

The Counterproliferation Support Program is continuing to support the joint DoD/FBI effort to deter, interdict, and prevent proliferation and acquisition of NBC/M by organized crime groups and individuals in Eastern Europe, the Baltic States, and states of the FSU. The DoD and FBI, in collaboration with the DOE, U.S. Intelligence, the Department of State, and the U.S. Customs Service, are developing counterproliferation training courses for foreign law enforcement agencies to prevent NBC/M and related materials from leaving their countries. A key focus is to adapt DoD technologies, operational capabilities, and training expertise to this endeavor. Key accomplishments since last year's report include site surveys in Kazakstan and Uzbekistan to assess training and assistance needs, preparation and approval of a course curriculum, and completion of final preparations for the first offering of the course scheduled for Kazak law enforcement officers in June 1997 at the International Law Enforcement Academy in Budapest. Training courses will continue at the rate of four basic counterproliferation courses per year for the next three years, along with specialty courses as the need arises. OSIA serves as the executive agent for the program and is responsible for its day-to-day operations. The specific level of funding for this project in FY 1998 has not been determined, but funding is expected to be reprogrammed from

other budgeted Counterproliferation Support Program projects consistent with other funding priorities.

The Counterproliferation Support Program, through its Integrated Proliferation Prevention and Open Source Monitoring project, is working to provide open source data collection, dissemination, research, and analysis of worldwide NBC/M proliferation activities. Through international conferences and training activities it is also working to develop international norms to stem NBC/M proliferation in critical countries. The Counterproliferation Support Program also supports ATSD(NCB)'s Deputy for Nuclear Matters in his continuing efforts to support DoD's oversight of DOE's nuclear stockpile stewardship responsibilities, the Nuclear Weapons Council and other senior advisory groups, policy formulation for operational nuclear weapons safety and control, and management activities associated with DoD nuclear stockpile responsibilities. ATSD(NCB)'s responsibilities in these areas extend well beyond counterproliferation issues and would have to be borne even in the absence of the Counterproliferation Support Program.

5.2.4 DoD Proliferation Prevention Programs Strongly Related to Counterproliferation. Several DoD Agency and Service programs are also addressing counterproliferation ACEs in proliferation prevention. These programs are described below and in Appendix C which provides additional details on program accomplishments and milestones. DoD and U.S. Intelligence activities and programs in proliferation prevention are discussed in the Intelligence Annex.

The Cooperative Threat Reduction (CTR) Program. Several ongoing projects under the CTR Program, managed by ATSD(NCB)'s Deputy for Cooperative Threat Reduction (DATSD(NCB)(CTR)), play a major role in proliferation prevention. Under the CTR Program, DoD assists states of the FSU to destroy, transport, store, disable, and safeguard NBC weapons and related materials and components; establish verifiable safeguards against their proliferation; facilitate the demilitarization of defense industries and conversion of military technologies and capabilities to civilian purposes; expand military-to-military contacts between the U.S. and FSU states; and support International Science and Technology Centers to aid in transitioning former FSU weapons scientists to peaceful endeavors. DATSD(NCB)(CTR) works closely with DOE in these matters. (See Section 6.3.4.)

Key accomplishments include: i) helping Ukraine, Belarus, and Kazakhstan to become non-nuclear weapons states; ii) delivering 117 rail car conversion kits to enhance the physical security of nuclear weapons and warheads in transit; iii) completing the foundation for Phase I of the Fissile Material Storage Facility at Mayak, Russia; iv) eliminating 64 submarine launched ballistic missile (SLBM) launchers and dismantling 81 Intercontinental Ballistic Missiles (ICBMs) and 20 heavy bombers; v) closing and sealing 59 of 194 nuclear weapons test tunnels and bore holes at Russia's Degelen Mountain test tunnel complex; vi) delivering three mobile chemical analytical laboratories in support of CW destruction activities; vii) establishing 17 joint venture partnerships between U.S. companies and FSU defense enterprises formerly associated with NBC/M production; viii) re-employing nearly 15,000 former Soviet weapons scientists and engineers on peaceful, civilian projects; ix) conducting 28 facility audits and examinations of CTR assistance activities through the end of 1996; and x) funding 177 exchanges between U.S. and FSU defense establishments.

Additional details for these programs are provided in Table 5.3 below and in Appendix C (Table C.10).

OSD Critical Technology Support Program. This program develops and publishes the *Militarily Critical Technologies List* (MCTL), a detailed and structured compendium of technologies DoD assesses as critical to maintaining superior U.S. military capabilities. It applies to all mission areas including counterproliferation. Part I of the MCTL, *Weapons Systems Technologies*, includes technologies whose technical performance parameters are at or above the minimum level necessary to ensure continuing superior performance of U.S. military systems. Part II, *Weapons of Mass Destruction*, addresses technologies required for the development, integration, or employment of NBC/M. Part III, *Critical Developing Technologies*, covers technologies which will enable increasingly superior military performance or an ability to maintain a superior capability more affordably. The MCTL is used as a technical foundation for U.S. export control proposals, licensing and export control processes, and intelligence collection. Technologies that a proliferant might use and that might need to be countered are addressed in Part II. Parts I and III cover those technologies that U.S. forces could use to thwart an NBC/M program or fight in an NBC environment. Technology Working Groups made up of experts from the U.S. Government, academia, and industry review and update the MCTL regularly to ensure key technologies are included and that new technologies applicable to counterproliferation are identified. The MCTL is reviewed on an ongoing basis and updated as required. The program is managed by the Deputy Under Secretary of Defense for International and Commercial Programs (DUSD(ICP)) through the Director for Multinational Technology Programs. Additional project details are provided in Table 5.3 and in Appendix C (Table C.9).

Defense Technology Security Administration. DTSA's mission is to develop and implement DoD policies regarding international transfers of dual-use and munitions items to ensure such transfers are consistent with U.S. national security interests. DTSA coordinates DoD's review of export licenses, referred by the Departments of State and Commerce, for their potential to contribute to the proliferation of NBC weapons, missile delivery systems, and other significant military capabilities. DTSA develops policies regarding the transfer of defense-related systems and technologies, participates in international export control negotiations, and provides technical support to diplomatic, intelligence, and enforcement efforts. Key accomplishments include: i) enhancement of the new multinational export control framework (the "Wassenaar Arrangement"); ii) review of over 18,000 export license applications for military and dual-use technologies; and iii) U.S. export control cooperation programs with other nations. Additional project details are provided in Table 5.3 below and in Appendix C (Table C.12).

On-Site Inspection Agency Programs. OSIA is responsible for several activities associated with countering proliferation. OSIA is a Joint Service DoD organization responsible for implementing inspection, escort, and monitoring requirements under the verification provisions of several U.S. international arms control treaties and confidence-building agreements involving NBC weapons. Key accomplishments in NBC weapons arms control treaties and agreements include: i) providing technical advisory support to the Comprehensive Test Ban Treaty (CTBT) Interagency Backstopping Group and the U.S. Delegation to the Conference on Disarmament; ii) providing expertise on on-site inspection to the CTBT Verification Monitoring Task Force On-Site Inspection Subgroup; iii) supporting the Intermediate Range Nuclear Forces (INF) Treaty, now in

its ninth year; iv) supporting the Strategic Arms Reduction Treaty (START I), now entering its third year; v) planning and preparing for verification operations in support of START II ratification; vi) maintaining a capability to monitor Russian nuclear tests under the auspices of the Threshold Test Ban Treaty (TTBT) and Peaceful Nuclear Explosions Treaty; and vii) completion of mock inspections and exercises as part of planning and preparation for the entry-into-force of the Chemical Weapons Convention (CWC) on April 29, 1997.

OSIA's support of Safeguards, Transparency, and Irreversibility (STI) initiatives focus on inspection and escort support for anticipated international agreements involving Mutual Reciprocal Inspection measurements of plutonium and highly enriched uranium components of disassembled nuclear weapons, and monitoring of Russian plutonium production reactors in accordance with the Plutonium Reactor Shutdown Agreement. OSIA is supporting DoD and DOE in STI talks with Russia and over the last year has escorted Russian teams to Rocky Flats, Lawrence Livermore National Laboratory (LLNL), and Oak Ridge National Laboratory (ORNL).

OSIA also serves as the executive agent in support of several DoD counterproliferation programs. It is the executive agent for DoD in support of the UN Special Commission (UNSCOM) on Iraq and for operations to identify and destroy Iraq's NBC/M infrastructure under UN Security Council Resolutions 687 and 715. OSIA also serves as executive agent for the DoD/FBI and DoD/U.S. Customs Service counterproliferation programs to deter the proliferation, acquisition, transfer, and transportation of NBC/M and related materials in Eastern Europe, the Baltic countries, and states of the FSU (as discussed in subsections 5.2.2 and 5.2.3 above). Additional OSIA project details are provided in Table 5.3 below and in Appendix C (Table C.11).

The Nuclear Treaty Program Office and CTBT Implementation. The CTBT was signed at the United Nations in New York on September 24, 1996, after nearly three years of negotiations. In anticipation of this event DoD established (in March 1996) a Deputy for Nuclear Treaty Programs (DATSD(NCB)(NTP)) serving under the ATSD(NCB) as CTBT Treaty Manager. The Deputy for Nuclear Treaty Programs oversees an integrated, DoD-wide CTBT implementation and compliance program, which includes: i) implementation of International Monitoring System (IMS) stations on U.S. territory or for which the U.S. has responsibility under the treaty; ii) development of the International Data Center (IDC) and a National Data Center to collate CTBT-related data; iii) transition of the prototype International Data Center (IDC) to its permanent location at the Headquarters of the CTBT Organization in Vienna; iv) R&D activities in nuclear test monitoring techniques (e.g., involving seismic, hydroacoustic, infrasound, and radionuclide signatures) satisfying congressional requirements and presidential safeguards; and v) treaty implementation and technical support. Key accomplishments since last year's report include: i) streamlined management of CTBT verification R&D programs under DSWA to improve CTBT implementation; ii) continued development of the global continuous threshold monitoring network and CTBT data fusion knowledge base; and iii) continued data collection, storage, fusion, and distribution technology development for the IDC and commencement of IDC transition to the Provisional Technical Secretariat in Vienna. The Nuclear Treaty Program Office is also responsible for providing DoD technical support in the areas of the nuclear Nonproliferation Treaty, fissile materials cut-off negotiations, and enhancement of nuclear safeguards through its enhanced nuclear safeguards program. Additional project details are provided in Table 5.3 and in Appendix C (Table C.8).

DSWA Nuclear Arms Control/CTBT Technology Support Program. This consolidated Research, Development, Test, and Evaluation (RDT&E) program develops capabilities and technologies, under the oversight of the Deputy for Nuclear Treaty Programs, to support the preparation, implementation, compliance, and verification of the CTBT. DSWA serves as the executive agent for DATSD(NCB)(NTP)'s CTBT Implementation Program described above. This program also consolidates former Air Force treaty verification activities. Additional project details are provided in Table 5.3 and in Appendix C (Table C.8).

DSWA Chemical Biological Arms Control Technology (CB ACT) Program. DSWA's CB ACT office has the lead within DoD for developing the technologies required to implement chemical and biological arms control treaties and agreements. The CB ACT office conducts RDT&E activities to meet DoD-identified treaty implementation, verification, monitoring, and inspection needs. The CB ACT program is working to protect U.S. national security interests, improve the effectiveness of verification efforts, assist in meeting U.S. legal obligations imposed by treaty provisions, support U.S. policy development, minimize inspection and implementation costs, and enhance the safety of treaty inspections. DSWA's designation as a combat support agency adds an important additional focus of considering the impact of CW/BW arms control agreements on warfighting commanders and their missions.

The current CB ACT program concentrates on the following six activities: i) *Technical Support to Negotiations*, including CWC compliance and implementation, bilateral arms control negotiations with Russia, the Biological Weapons Convention (BWC) Review Conferences, and exchange visits to military biological facilities under the auspices of the U.S./United Kingdom/Russia Trilateral Statement; ii) *Compliance Support/Data Management*, by supporting the development of DoD data and notification management systems consistent with treaty and international agreement reporting provisions, such as the CWC Information Management System, the Chemical Agent Management Information Network, and a proposed BWC data management system; iii) *Inspector Safety Monitoring*, by developing a real-time portable CW agent monitor for the detection of trace levels of volatile CWC-scheduled chemicals to assure that inspectors are not exposed to chemical hazards; iv) *Off-Site Monitoring*, by evaluating technologies for use in monitoring the perimeter of facilities undergoing CWC challenge inspections; v) *Non-Destructive Evaluation*, by developing techniques for the non-invasive interrogation of munitions and containers; and vi) *On-Site Analysis*, by providing state-of-the-art sample collection, screening, preparation, and determinative analysis methods and equipment integrated into a modular, field portable, "fly-away", On-Site Lab which was used to support UN activities in Iraq and has been adapted for use in the CWC compliance program. Additional information on this program may be found in Table 5.3 and in Appendix C (Table C.8).

DSWA START Verification Technology Programs. DSWA is responsible for the START Verification Technology program, which develops technologies to enable verification of the START I, START II, and follow-on nuclear weapons treaties. Technologies being developed include non-intrusive detection of nuclear weapon systems and reentry bodies. Key accomplishments include achieving full operational capability of the START Central Data System, development of a fieldable prototype gravity gradiometer for use in treaty verification, and development of technologies and procedures that enable the monitoring of nuclear weapons

throughout their life cycle. Additional project details are provided in Table 5.3 and in Appendix C (Table C.8).

Table 5.3: Key DoD Counterproliferation Programs in Proliferation Prevention

Program/Project Title	Project Description	DoD ACE	Agency	FY 98 Budget [\$M]	PE No.
CP Support Program					
• Joint DoD/FBI Proliferation Prevention Program	• Adapt DoD technology and training expertise to enhance capabilities of foreign law enforcement agencies in stemming proliferation at its source	13, 14	ATSD (NCB) OSIA	-*	605160D
• Integrated Prolif. Prev. and Open Source Monitoring	• Integrated data collection, research, and analysis in support of proliferation prevention	13, 8	ATSD (NCB)	1.275	603160D
• Nuclear Matters Projects	• Assessments of reliability, safety, surety, and sustainability of the nuclear stockpile	5, 2, 3	ATSD (NCB)	1.914	605160D
Strongly Related CP Programs					
• DoD/U.S. Customs Proliferation Prevention Program	• Expand and improve efforts to prevent proliferation and acquisition of NBC/M and related materials in the FSU, Eastern Europe, and the Baltics	14, 13	OSD OSIA	3.000**	O&M
• CTR Programs	• Assisting FSU states in destroying, controlling, and demilitarizing NBC/M and associated infrastructure	15	ATSD (NCB)	382.200	FSU Threat Reduction
• OSD Critical Technology Support Program	• Preparation of the <i>Militarily Critical Technologies List</i> to support export control activities	14	DUSD (ICP)	2.690	605110D
• DTSA Activities	• Develops and implements DoD policies regarding military and dual-use exports and coordinates DoD's review of export licenses	14	DTSA	10.542	O&M
• OSIA Programs	• Implementation of inspection, escort, monitoring, and treaty verification measures for nuclear weapons arms control treaties and agreements • Support for CW and BW agreements • CTBT technical advisory support • Support for STI agreements • Support for UNSCOM operations in Iraq	15	OSIA	44.877 35.077 1.014 2.428 5.343	O&M O&M/Proc. O&M O&M O&M
• Nuclear Arms Control/CTBT Technology Support Program	• RDT&E of technologies to support CTBT implementation, compliance, and verification • Enhanced nuclear safeguards	15	DSWA	56.299 1.701	603711H O&M
• DSWA Chemical Biological Arms Control Technology Program	• RDT&E in implementation, verification, monitoring, and inspection support for CW/BW arms control initiatives, including the CWC and BWC	15	DSWA	9.589	603711H
• DSWA START Verification Technology Program	• RDT&E of technologies to enable verification of START and follow-on nuclear weapons treaties	15	DSWA	8.072	603711H
• USAF Nuclear Detonation Detection System	• Integrates and supports nuclear detonation detection sensors on GPS satellites; develops and procures ground system for nuclear detonation reporting	15	Air Force	14.145 9.155	305913F procurement
• Navy SEI System Support Program	• Procurement and fleet integration of SEI system upgrades to aid in tracking NBC/M-related shipments	13	Navy	1.626	204575N

* Work continues on this program using funds authorized and appropriated in prior years. Although no funds were specifically identified for the program in the President's FY 1998 budget request, DoD may seek to reprogram funds as needed to continue work on the program.

** Estimate based on congressional requirements to spend not more than \$9.0 million over 3 years.

Air Force Nuclear Detonation Detection System. This program provides the capability to detect endo- and exo-atmospheric nuclear detonations worldwide. Key accomplishments include integration of new nuclear detonation phenomenology sensors on Global Positioning System (GPS) Block IIR satellites and testing of ground processing and display system software and hardware. Additional project details are provided in Table 5.3 and in Appendix C (Table C.5).

Navy SEI Support Program. The Navy has been working with the Counterproliferation Support Program to expedite the deployment of the SEI system by providing O&M and procurement support; accelerating system development; and providing testing and fleet integration support. In FY 1998, the program transitions to the Navy which will continue implementation of the SEI system into the fleet by upgrading existing (and fleet-integrated) signal processors. Fleet integration is scheduled for FY 1999. Additional project details are provided in Table 5.3 and in Appendix C (Table C.4).

5.2.5 Near-, Mid-, and Long-Term Milestones for DoD Proliferation Prevention Programs. Figure 5.2 summarizes the time-phased milestones of the key proliferation prevention activities and programs discussed above.

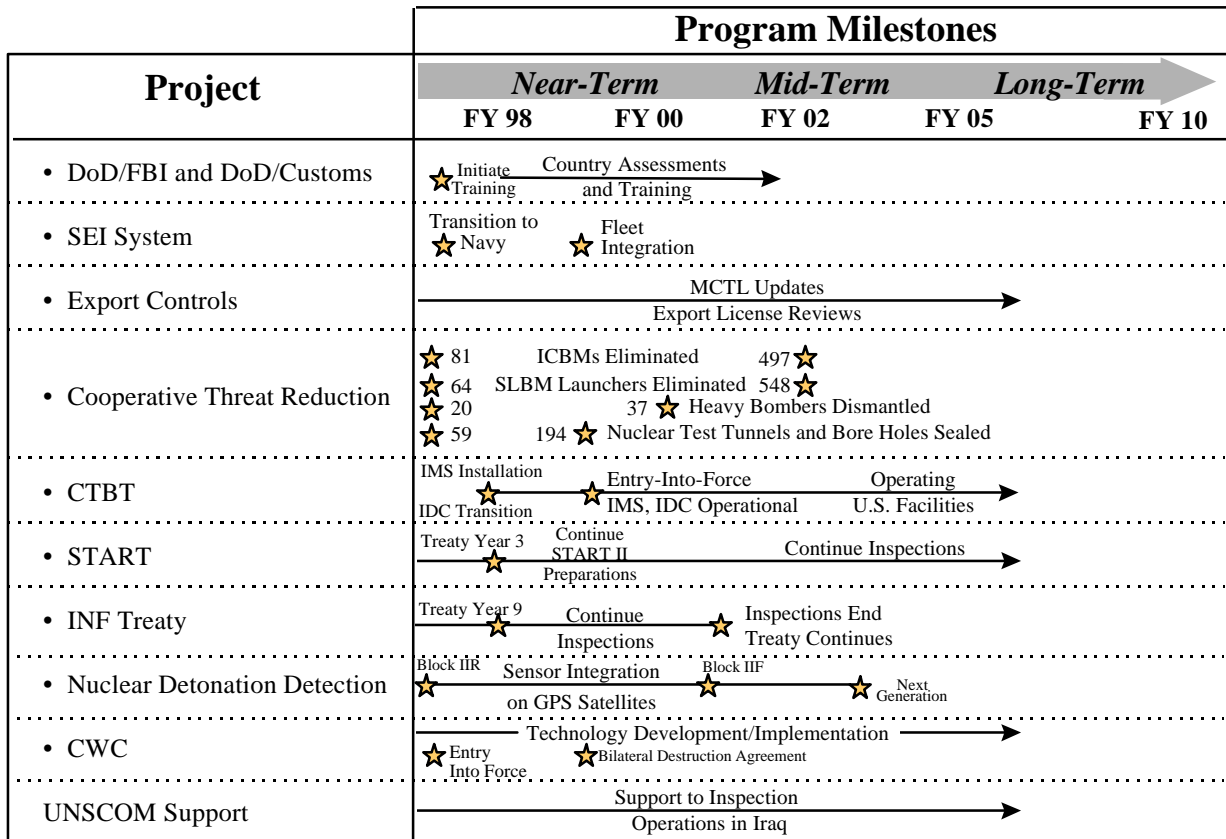


Figure 5.2 Time-Phased Milestones of Proliferation Prevention Programs

5.3 Status and Accomplishments of DoD Strategic and Tactical Intelligence Programs

5.3.1 Relevant Counterproliferation ACEs and DoD Policy Objectives in Strategic and Tactical Intelligence. The principal focus of DoD intelligence activities is to provide proliferation-related information that is clear, accurate, and timely enough to support, first and foremost, the needs of the military commanders (DoD ACE priority 8). These activities include DoD support to the national strategic intelligence effort down to providing the soldier in the field with tactical intelligence specifically related to his immediate situation. DoD works closely with U.S. Intelligence to perform these activities. The Counterproliferation Support Program is also making contributions in this area as well. These projects are summarized in Table 5.4 below and in Appendix C. A more thorough description of how DoD intelligence activities support counterproliferation policy and strategy objectives may be found in the Intelligence Annex to this report.

5.3.2 New DoD Initiatives in Strategic and Tactical Intelligence. See the Intelligence Annex to this report.

5.3.3 Counterproliferation Support Program Projects in Strategic and Tactical Intelligence. Several Counterproliferation Support Program projects in the proliferation prevention and battlefield surveillance functional areas are relevant to strategic and tactical intelligence, including: i) the Integrated Proliferation Prevention and Open Source Monitoring project; ii) the Tactical Unattended Ground Sensor (TUGS) and the airborne tactical Forward Looking Infrared (FLIR) sensor being developed for NBC/M and underground facility surveillance, characterization, and BDA; and iii) the incorporation of a mature Automatic Target Recognition (ATR) system into the Joint Surveillance Target Attack Radar System (JSTARS) aircraft for mobile target detection. These projects are described in subsections 5.2.3 and 5.4.2.

In addition to these projects, the High Frequency Active Auroral Research Project (HAARP) is exploring the use of low frequency electromagnetic waves for detecting and imaging underground structures and tunnels. This program had not been considered a high priority by the Administration and was not included in its FY 1997 budget request. However, Congress provided funding for the Counterproliferation Support Program to work with the Air Force Phillips Laboratory to expedite the determination of the viability and military utility of the HAARP concept. A workshop, entitled “Longwave Radio Frequency Imaging of Underground Structures”, is scheduled for May 1997 to provide government organizations with an overview of this research area and define a plan for future research. The HAARP transmitter is being upgraded, and a demonstration of the concept’s underground facility detection capabilities is currently scheduled for 1997. No FY 1998 DoD funding is currently planned for this Congressional Special Interest Program. Additional project details are provided in Table 5.4 and in Appendix C (Tables C.1 and C.5).

5.3.4 Strategic and Tactical Intelligence Programs Strongly Related to Counterproliferation. The Air Force, in its Remote Optical Sensing Program, is developing an airborne lidar (light detection and ranging) for long range remote sensing applications, including the detection and characterization of NBC weapon production signatures. Additional project details are provided in Table 5.4 and in Appendix C (Table C.5). Additional DoD strategic and tactical

intelligence programs strongly related to countering proliferation are described in the Intelligence Annex to this report.

Table 5.4: Key DoD Counterproliferation Programs in Strategic and Tactical Intelligence

Program/Project Title	Project Description	DoD ACE	Agency	FY 98 Budget [\$M]	PE No.
<u>CP Support Program</u>					
• HAARP Program	• Single source transmission of long wavelength electromagnetic waves for underground structure detection and imaging	3, 8	Air Force	0*	603160D
• Proliferation Prevention Projects	• Integrated Proliferation Prevention and Open Source Monitoring	(See Section 5.2.3)			
• Battlefield Surveillance Projects	• TUGS and FLIR systems RDT&E • Incorporation of mature ATR into JSTARS	(See Section 5.4.2)			
<u>Strongly Related CP Programs</u>					
• Air Force HAARP Support	• Hardware development and operational support	3, 8	Air Force	0*	602601F
• Remote Optical Sensing Program	• Aircraft based long range lidar for remote sensing of NBC weapon production signatures	8, 1	Air Force DIA	0.800	602601F
• Joint DoD/U.S. Intell. Programs	• See Intelligence Annex	(See Intelligence Annex)			

* Currently, no DoD FY 1998 funds are budgeted for this Congressional Special Interest Program.

5.4 Status and Accomplishments of DoD Battlefield Surveillance Programs

5.4.1 Relevant Counterproliferation ACEs and DoD Policy Objectives for Battlefield Surveillance. In the battlefield surveillance area, DoD is improving capabilities to detect, identify, and characterize NBC/M forces and associated infrastructure elements in a timely manner to support targeting, mission/strike planning, counterforce operations, and prompt post-strike BDA activities. Emphasis is being placed on: detection, characterization, BDA, and collateral effects monitoring of underground and surface NBC/M facilities (DoD ACE priorities 2, 3, and 8); focused target planning activities for NBC/M facilities (DoD ACE priority 11); and continuous wide-area surveillance and mobile target detection, particularly NBC-armed mobile missile launchers (DoD ACE priorities 8 and 12). (Programs involving the detection and identification of NBC agents are discussed under the passive defense functional area, Section 5.7.) This effort is being coordinated with U.S. Intelligence; the details of which are provided in the Intelligence Annex.

5.4.2 Counterproliferation Support Program Projects in Battlefield Surveillance. The Counterproliferation Support Program is supporting several projects in this area, including: i) developing enhanced sensor technologies, including the TUGS and airborne tactical FLIR sensor, for NBC/M target surveillance, characterization, BDA, and collateral effects monitoring; ii) development of tactical multi-sensor data fusion techniques and signature collection to support underground target characterization and BDA; iii) integration of NBC/M target characterization, BDA, and collateral effects sensors into unmanned aerial vehicles (UAVs); iv) incorporation of a mature ATR algorithm and processor system into JSTARS to provide near real-time detection and

identification of time critical targets; and v) integrated operational testing of these systems, as part of the Counterproliferation ACTDs (see subsection 5.5.3), to support the rapid fielding of integrated battlefield surveillance and counterforce capabilities. The DOE National Laboratories are also providing technology R&D and technical support for the TUGS and ATR projects. With completion of ATR demonstrations on JSTARS test assets scheduled for later this year, the Counterproliferation Support Program will end funding of this project. BMDO has expressed interest in continuing this ATR project as part of its efforts to improve counterforce operations in support of theater missile defense. DARPA is also involved in ATR R&D activities (see subsection 5.5.4).

Key accomplishments since last year's report include: i) developed tactical FLIR design options, initiated proof-of-principle demonstrations of system modifications, and collected imagery to improve and support weapon delivery testing; ii) constructed and field tested a brassboard TUGS system; iii) continued data collection from representative NBC/M facilities during weapon detonations to evaluate TUGS performance and demonstrate utility; and iv) continued flight testing and capability demonstration of the ATR system on JSTARS test assets. Additional project details are provided in Table 5.5 and in Appendix C (Table C.1).

5.4.3 Battlefield Surveillance Programs Strongly Related to Counterproliferation.

These programs are described in the Intelligence Annex to this report.

Table 5.5: Key DoD Counterproliferation Programs in Battlefield Surveillance

Program/Project Title	Project Description	DoD ACE	Agency	FY 98 Budget [\$M]	PE No.
<u>CP Support Program</u>					
• TUGS and Tactical FLIR Sensor Technology Projects	• Development of TUGS and tactical FLIR sensor systems for surveillance, characterization, BDA, and collateral effects monitoring of NBC/M and underground facilities	2, 3, 8	DSWA Air Force DOE	7.700	603160D
• Tactical Multi-Sensor Data Fusion	• RDT&E to support accurate target characterization and BDA of NBC/M and underground facilities	2, 3, 8, 11	DSWA DARPA	0.750	603160D
<u>Strongly Related CP Programs</u>					
• Joint DoD/U.S. Intell. Programs	• See Intelligence Annex	(See Intelligence Annex)			

5.4.4 Near-, Mid-, and Long-Term Milestones in DoD Battlefield Surveillance

Programs. Figure 5.3 summarizes the time-phased milestones of the battlefield surveillance programs discussed above, which are part of the ongoing Counterproliferation (CP1) ACTD and candidates for the follow-on CP2 ACTD. Additional program milestone information may be found in the Intelligence Annex to this report.

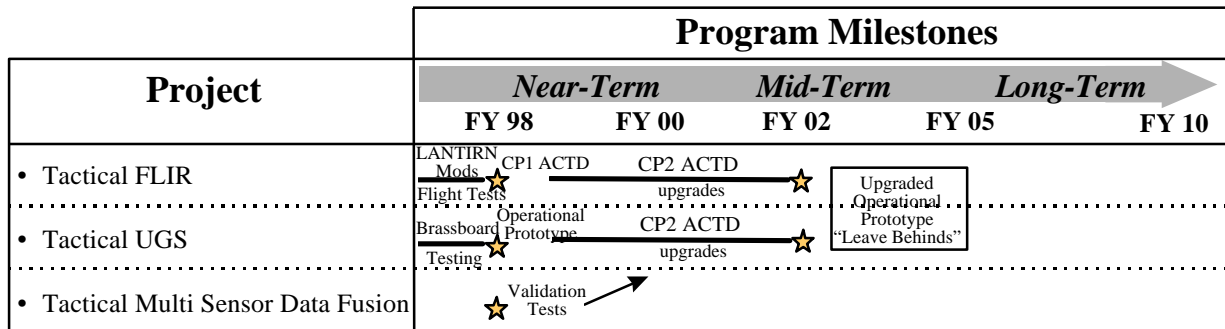


Figure 5.3 Time-Phased Milestones of Battlefield Surveillance Programs

5.5 Status and Accomplishments of DoD NBC/M Counterforce Programs

5.5.1 Relevant Counterproliferation ACEs and DoD Policy Perspectives. In the NBC/M counterforce area, DoD is working to improve capabilities to defeat NBC/M threats before they can be used against U.S., allied, and coalition forces. Service resources are being devoted to maintaining U.S. forces at the highest state of readiness to enable a quick and effective response in regional contingencies throughout the world. Resources are targeted on improving battlefield surveillance and counterforce capabilities to find and destroy NBC/M forces and their supporting infrastructure elements while minimizing collateral effects. Emphasis is on defeating NBC/M facilities, including hardened surface and underground facilities, while minimizing associated collateral effects (DoD ACE priorities 2 and 3). Projects involving advanced weapons for NBC/M target defeat that minimize or mitigate collateral effects are underway as are programs to better understand NBC/M target vulnerability/response and collateral effects phenomenology (DoD ACE priority 11). Detection, tracking, and defeat of mobile NBC/M targets, especially mobile ballistic and cruise missile launchers, are also key counterforce areas (DoD ACE priority 12). Sensors under development provide enhanced target characterization, improved BDA and collateral effects monitoring, and more efficient restrike planning (DoD ACE priorities 2, 3, 8, 12).

5.5.2 New DoD Initiatives in NBC/M Counterforce. The CP2 Counterforce ACTD and the Cooperative Army/Navy Hard Target Tactical Missile System program are new programs initiated since last year's report.

The CP2 Counterforce ACTD. The ongoing Counterproliferation ACTD for NBC/M target defeat (denoted CP1 ACTD) establishes a new baseline for military counterforce capabilities against NBC/M facilities. The second, follow-on Counterproliferation Counterforce ACTD (denoted CP2 ACTD) will continue to address CINC-prioritized shortfalls in counterforce capabilities against hard and underground NBC/M facilities. The CP2 ACTD has been approved for an FY 1997 start. FY 1997 efforts focus on final definition of CINC requirements, selection of appropriately mature technologies for inclusion in the ACTD, and development and approval of a CP2 ACTD Implementation Directive and a Management Plan. These items are scheduled to be in place by June 1997. CP2 ACTD technology development efforts are scheduled to begin in the first quarter of FY 1998 and be completed by the fourth quarter of FY 2002. Based on CP1 ACTD

successes to date, CINC U.S. European Command (USEUCOM) has agreed to sponsor the CP2 ACTD. In addition, CINC U.S. Pacific Command (USPACOM) and CINC U.S. Strategic Command (USSTRATCOM) have expressed interest in sponsoring the development of target planning and decision support tools for the CP2 ACTD. The selection of maturing technologies to be evaluated and demonstrated during the CP2 ACTD will be based on their potential military utility in meeting the high priority counterproliferation required capabilities of the CINCs. The following capabilities are being considered for inclusion in the CP2 ACTD: i) improved counterforce planning and decision support tools; ii) alternative payloads to enhance physical and functional target kills while mitigating collateral effects; iii) standoff precision delivery and improved penetration capabilities by modifying existing or developing weapon systems; iv) improved combat assessment capabilities through improved detection and prediction of collateral effects and improved collection of BDA information; and v) enhanced intelligence support by improving information dissemination, target characterization, and target functional/nodal analysis.

The Cooperative Army/Navy Hard Target Tactical Missile System. In direct response to the counterproliferation ACEs and the CINC counterproliferation required capabilities, the Counterproliferation Support Program is supporting a new initiative in FY 1997 to develop an earth penetrating variant of the Army's Tactical Missile System (TACMS) deliverable by the existing Army M270 tactical missile launcher and eventually by Navy surface ships and submarines. This variant, proposed by the Army TACMS program manager in conjunction with Navy Strategic Systems Programs, makes use of the demonstrated capabilities of the Army TACMS missile system and reentry and penetrator components developed by the Navy to hold the full spectrum of NBC/M-related targets at risk. This project leverages developments in strategic reentry systems technology (including aeroshells, attitude control systems, and guidance systems), advanced penetrator technology, and the Hard Target Smart Fuse (HTSF) under development by DSWA and the Air Force (see subsection 5.5.3). Current efforts are focusing on defining a near-term ACTD to support an ACTD involving live fire testing in FY 1999. Funding for FY 1998 is under review.

5.5.3 Counterproliferation Support Program Projects in NBC/M Counterforce. The centerpiece of the Counterproliferation Support Program's NBC/M counterforce activity is the CP1 ACTD currently under way and the follow-on CP2 ACTD. These ACTDs are jointly sponsored by DSWA and CINC USEUCOM and support the rapid fielding of several new NBC/M counterforce capabilities through integrated operational testing of advanced technology prototype weapons, sensors, and target planning tools. The overall objective of the Counterproliferation ACTDs is to develop, demonstrate, and deliver to the CINCs counterforce capabilities to hold NBC/M targets at risk while minimizing collateral effects. The CP1 ACTD is focusing on the delivery of advanced operational capabilities in weapons, sensors, and target planning tools to defeat hard and shallow buried NBC/M targets. The follow-on CP2 ACTD will provide enhanced NBC/M counterforce capabilities against a wider set of potential NBC/M and underground targets.

Projects supporting the CP1 ACTD include: i) developing sensor systems for target characterization and BDA (including the TUGS and tactical FLIR sensors and the tactical multi-sensor fusion project described in subsection 5.4.2); ii) improving the understanding of and developing hazard prediction models for collateral effects release and transport phenomenology; iii) improving the state of knowledge in weapons effects and NBC/M target vulnerability and response; iv) developing an advanced penetrating weapon, the Advanced Unitary Penetrator (AUP), for

hardened or underground target defeat; v) developing a weapon borne sensor (WBS) and the HTSF to enhance the lethality of penetrating weapons against hard and underground targets; vi) developing advanced warheads and payloads for enhanced lethality and functional kill against NBC/M targets; vii) developing the inertial terrain-aided guidance (ITAG) all-weather weapon guidance package designed to be compatible with existing munitions; viii) developing the Munitions Effectiveness Assessment (MEA) and the Integrated MEA (IMEA) targeting tools to assist in targeting, weaponeering, and strike planning against NBC/M facilities; and ix) integrated operational testing, as part of the Counterproliferation ACTD demonstrations, to support rapid user assessment and fielding of these new capabilities. The DOE National Laboratories are also providing technical support to the TUGS, FLIR, and ITAG projects. Counterproliferation Support Program projects in NBC/M counterforce are further summarized in Table 5.6 below and in Appendix C (Table C.1).

Key accomplishments in counterforce projects since last year's report include: i) completion of Phase I integrated demonstrations of the CP1 ACTD, including static and live weapon drops on a simulated BW storage facility to demonstrate the integrated capabilities of sensors, weapons, target planning tools, and collateral effects prediction; ii) demonstration of controlled weapon penetration and detonation depth using the HTSF and successful integration of the GBU-24/HTSF with F-15E and F/A-18 aircraft; iii) scale testing of the line payout system for the WBS; iv) model validation for conventional weapons effects against hard and buried targets; v) accurate prediction of atmospheric transport of hazard plumes during CP1 ACTD demonstrations; vi) continued IMEA tool hazard assessment modeling support to USEUCOM in support of contingency operations; vii) assessment by warfighters of IMEA software as a valuable aid for target planning and weaponeering; viii) completion of software simulation and initiation of ITAG hardware fabrication; and ix) completion of preliminary design definitions and initial trade studies for the Cooperative Army/Navy Hard Target Tactical Missile system.

5.5.4 NBC/M Counterforce Programs Strongly Related to Counterproliferation.

Service and DoD Agency programs are also addressing counterproliferation ACEs in NBC/M counterforce. These programs are described in this subsection.

Hard and/or Deeply Buried Target Defeat Capability (HDBTDC) Program. This JROC and USD(A&T) approved effort is developing non-nuclear concepts to defeat hard and/or deeply buried targets. This Joint Service program was established in response to Mission Need Statements from USSTRATCOM and the Combat Air Force. The Air Force is designated as the lead Service, with participation by the other Services, the Joint Staff, DSWA, OSD, DoD and DOE laboratories, and DIA. Currently, the program is in the "Concept Exploration and Definition" phase of the acquisition process. The program goals and objectives are: i) deny, disrupt, or destroy the highest priority assets essential to the enemy's warfighting ability and which are heavily defended and protectively hardened; ii) develop weapons having operational advantages over existing weaponry in defeating hard and deeply buried targets; and iii) provide improved capabilities that are significant, not marginal. Key targets to be defeated include hardened and/or deeply buried command and control facilities and tunnel surface-to-surface missile storage and assembly complexes. Key program accomplishments include forming an Integrated Product Team (IPT) structure for efficient program development, collection of HDBTDC concepts from industry, assessment of baseline weapons systems concepts, development of an analysis of alternatives

framework and study plan, development of a requirements definition plan, and the formation of an ACTD working group. Efforts are under way to explore the possibility of conducting target defeat concept demonstrations as part of the CP2 ACTD. This program is supported by Air Force and Navy program elements and DSWA's Hard Target Defeat Program described below. Additional details are provided in Table 5.6 and in Appendix C (Tables C.4 and C.5).

DSWA Hard Target Defeat Program. DSWA initiated its Hard Target Defeat Program in FY 1996 to: i) evaluate the hard target defeat problem end-to-end, from detection through counterforce to BDA; and ii) develop improved tactics and technologies to defeat hard targets, especially tunnels. This program supports the HDBTDC IPT with weapon-target interaction analyses for defeating targets that are difficult to counter because of their physical hardness. An IPT has been established to employ existing analysis tools and data bases to determine the physical and functional vulnerability of high value/high risk targets and provide quantitative results to support analysis of alternative target defeat approaches. This program also supports the development of advanced capabilities in tunnel facility characterization, target planning, weapon effects, and functional defeat mechanisms. These efforts complement the NBC/M counterforce activities supported by the Counterproliferation Support Program, including the Counterproliferation ACTDs. Additional project details are provided in Table 5.6 and in Appendix C (Table C.8).

Air Force Agent Defeat Weapon Program. This program was initiated in response to a Combat Air Force Mission Need Statement. The objective of the current Concept Exploration and Definition acquisition activity is to develop an agent defeat weapon to neutralize, destroy, or deny access or immobilize CW/BW agents and their associated weapon and delivery systems. All agent defeat weapon concepts will minimize collateral damage and effects and be deliverable by current Air Force platforms. Key program accomplishments include forming an IPT structure, building a preliminary assessment framework, collecting weapon system concepts from industry and the DoD and DOE laboratories, construction of an empirical lethality model to determine the effectiveness of inventory and conceptual weapons systems against CW/BW agents, and forming an ACTD working group. Additional information is provided in Table 5.6 and in Appendix C (Table C.5).

DSWA Weapons Systems Lethality Program. This program focuses on the development and validation of methodologies and research tools for applied analysis performed under the Counterproliferation Support Program as well as the Force Protection Initiative and other emerging counterterrorism programs (see Section 8.3). It supplies the CINCs with targeting tools for NBC/M and conventional targets and tools for collateral effects and hazard prediction through the USEUCOM-sponsored Counterproliferation ACTDs. Targeting tools are available to other users through the Joint Technical Coordinating Group for Munitions Effectiveness. The program conducts precision and subscale testing and advanced numerical calculations to develop and validate methodologies associated with weapon-target interactions and the transport and dispersal of hazardous NBC materials, including NBC collateral effects releases. Additional project details are provided in Table 5.6 and in Appendix C (Table C.8).

DARPA Surveillance Sensor and Exploitation Systems Program. This RDT&E program is designed to improve capabilities to detect, identify, and track high value, time critical fixed and mobile targets, including mobile NBC-armed missile launchers and NBC/M facilities and

infrastructure elements, by developing sensors to defeat camouflage, concealment, and deception practices and providing near real-time exploitation of wide area imagery. Key accomplishments include: i) development of a foliage penetration (FOPEN) radar concept and verification of systems requirements for a FOPEN Airborne Demonstration Radar; ii) completion of a critical technology demonstration of an ultra-wide band synthetic aperture radar antenna design and automatic target detection/cueing technologies; iii) transitioning target recognition algorithms into

Table 5.6: Key DoD Counterproliferation Programs in NBC/M Counterforce

Program/Project Title	Project Description	DoD ACE	Agency	FY 98 Budget [\$M]	PE No.
CP Support Program		(See Section 5.4)			
• Battlefield Surveillance Projects	• See Section 5.4				
• Collateral Effects Phenomenology Assessment	• Source term characterization and transport prediction, phenomenology experiments, and assessment tool development	2, 3, 11	DSWA	8.000	603160D
• Advanced Weapons Systems (AUP, HTSF, WBS, and ITAG)	• Development of an enhanced penetrating munition for hard and underground target defeat offering expanded compatibility with delivery platforms and an all-weather capability	2, 3	DSWA Air Force DOE	12.600	603160D
• NBC/M Target Planning and Response/Vulnerability Assessment	• Experimental and analytical analyses of NBC/M target response/vulnerability and automated target planning for NBC/M facilities	11, 2, 3, 5	DSWA	5.475	603160D
• Counterproliferation ACTDs	• Integrated operational testing to support early deployment of new counterforce capabilities against NBC/M and underground targets	2, 3, 11, 8	DSWA EUCOM	10.579	603160D
• Cooperative Army/Navy Hard Target Missile System	• Development of an earth penetrating variant of the Army's Tactical Missile System	3	Army Navy	_*	
Strongly Related CP Programs					
• Hard and/or Deeply Buried Target Defeat Capability	• Joint Service evaluation and development of hard and deeply buried target defeat capabilities	3, 2, 8, 11, 5	Services DSWA OSD DIA	9.968	603311F 604327F 604327N
• Air Force Agent Defeat Weapon Program	• Develop capabilities and munitions to defeat or neutralize BW/CW agents and their delivery systems	2, 4, 12, 11	Air Force	0.500	604222F
• DSWA Hard Target Defeat Program	• End-to-end evaluation and development of improved tactics and technologies for hard target characterization and defeat	3, 2, 11	DSWA	13.202	602715H
• DSWA Weapons Systems Lethality Program	• Evaluation of conventional weapon lethality and effects and collateral effects assessment; maintain core competency in nuclear weapons effects	2, 3, 5, 11	DSWA	18.807	602715H
• DARPA Surveillance Sensor and Exploitation Systems Program	• Develop sensors to defeat camouflage, concealment, and deception practices and provide near real-time semi-automated exploitation of wide area imagery to track critical mobile targets	12, 8, 2, 3	DARPA	81.600	603762E
• DARPA Information Integration Systems Program	• Integrated, all-source, geographically referenced battlefield knowledge base and information distribution system development for enhanced real-time situation assessment and intelligence dissemination	12, 8, 2, 3	DARPA	96.424	603760E

* FY 1998 funding for this project has not been determined.

DARPA's Semi-Automated Imagery Processing (SAIP) ACTD currently under way and demonstrating the use of U-2 aircraft imagery on the enhanced tactical radar correlator; and iv) initial development of the next generation of model-based ATR systems addressing target articulation and obscuration. Additional project details are provided in Table 5.6 and in Appendix C (Table C.7).

DARPA Information Integration Systems Program. This program supports efforts to enhance real-time situation assessments by developing an integrated, all-source, geographically referenced battlefield knowledge base and information distribution system. It supports improved capabilities to detect, identify, and track high value, time critical fixed and mobile targets, including NBC-armed missile launchers and NBC/M support facilities. Key accomplishments include: i) completed integration of a single intelligence source correlator; ii) demonstration of the functionality of a global broadcast service and information servers for rapid dissemination of imagery products; iii) demonstration of the operational utility of disseminating intelligence products (imagery and UAV video) and one way video teleconferencing of commanders' intent; and iv) completion of nine independent correlation systems using open systems architectures. Additional project details are provided in Table 5.6 and in Appendix C (Table C.7).

5.5.5 Near-, Mid-, and Long-Term Milestones for DoD NBC/M Counterforce Programs. Figure 5.4 summarizes the time-phased milestones of those NBC/M counterforce programs discussed above and having clearly identifiable acquisition milestones. With the

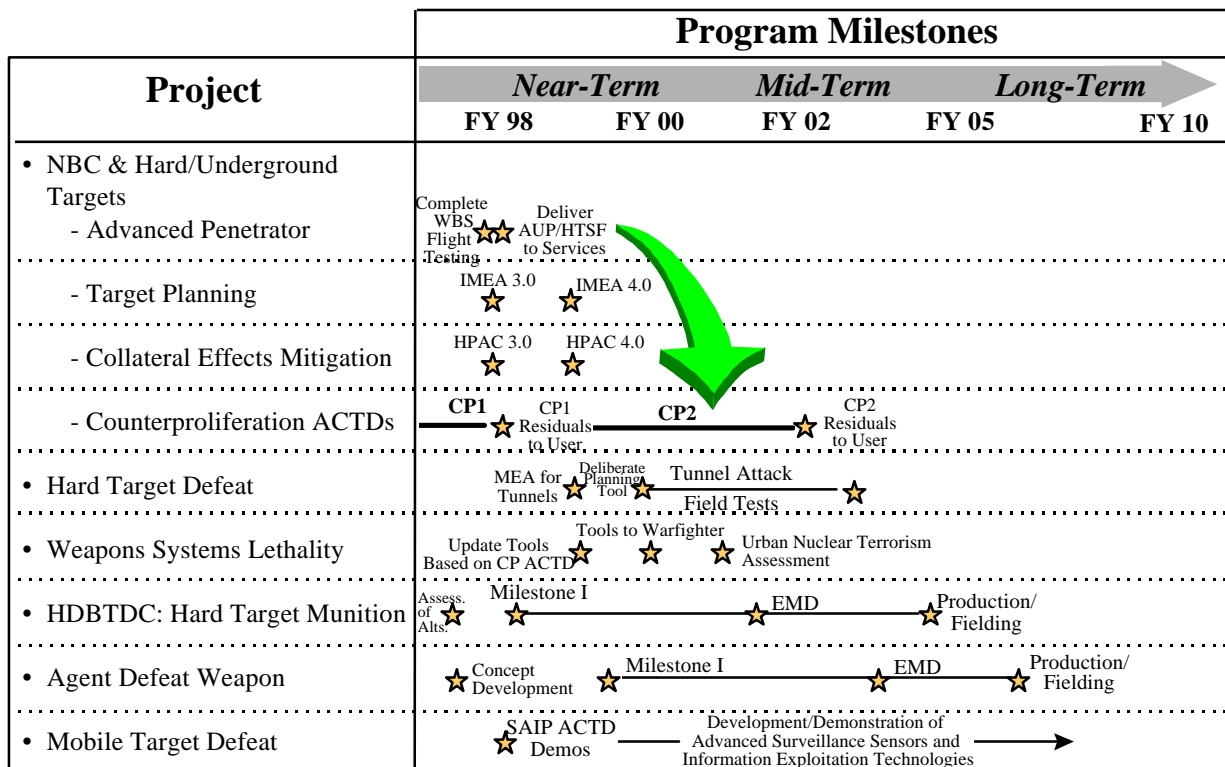


Figure 5.4 Time-Phased Milestones of NBC/M Counterforce Programs

completion of the Counterforce CP2 ACTD considerable capability enhancements will be in place for defeating hard, underground, and NBC/M targets. Furthermore, early in the next century a whole new generation of mobile target defeat technologies will be reaching fruition.

5.6 Status and Accomplishments of DoD Active Defense Programs

5.6.1 Relevant Counterproliferation ACEs and DoD Policy Perspectives. Active defense makes an important contribution to counterproliferation by protecting U.S., allied and coalition forces, and noncombatants from NBC weapons by intercepting and destroying ballistic missiles, cruise missiles, and aircraft armed with NBC weapons in flight and before they can reach friends and allies. Active defense, particularly theater ballistic missile defense (TBMD) (DoD ACE priority 4) and cruise missile defense (DoD ACE priority 7), continues to be a top DoD counterproliferation-related priority.

DoD's theater missile defense (TMD) approach is to build on present air and missile defense systems to provide a near-term defense, and then develop capabilities to intercept enemy air and missile systems at higher altitudes and longer ranges to keep NBC weapons even farther away from U.S. and allied forces. Since threat missile systems differ in their characteristics and capabilities, no single defensive system can counter them with sufficient effectiveness or with the high confidence required for defense against NBC weapons. This is why DoD is developing a "family of systems". DoD's policy is first to upgrade and develop systems that will provide defense for theater forces. The first systems receiving attention are systems that are already fielded, specifically the Marine Corps Hawk system and the Army's PATRIOT system, both of which are undergoing upgrades that will increase their TMD capabilities. BMDO is managing the development of a set of "core" active defense programs that will provide additional capabilities. In addition to follow-on upgrades of the PATRIOT system, BMDO is leveraging the technologies of the Navy's AEGIS and Standard Missile (SM) systems to give them endoatmospheric missile intercept capabilities in the near term and exoatmospheric capabilities in the far term. BMDO and the Army are also developing an exo-/endo-atmospheric interceptor and kill vehicle. Joining these core programs is the Air Force's Airborne Laser (ABL) system which will push the kill zone and the potential of associated NBC collateral effects even further away from friendly forces by intercepting theater ballistic missiles in their boost phase. Effective boost phase defense, where intercept occurs early in flight over the launching country, serves as a powerful deterrent to NBC/M use.

Underlying all of these efforts are programs to develop the corresponding battle management/command, control, communications, computers, and intelligence (BMC4I) capabilities necessary to achieve an effective defense with Joint Service interoperability. BMDO also participates in several international programs to help allies develop TMD capabilities and to learn from what they accomplish, with the aim that these systems, when fielded, will be interoperable with U.S. systems. BMDO and DARPA programs are continuing to develop advanced technologies to enhance future active defense systems. BMDO also manages the National Missile Defense (NMD) program for U.S. homeland defense.

5.6.2 New DoD Initiatives in Active Defense. Since the last CPRC report was issued, DoD has undertaken a number of initiatives in the active defense area to move some of the core

systems closer to deployment and meet the highly aggressive schedule requirements necessary to provide enhanced active defense capabilities against emerging threats. In the FY 1998 budget request, DoD has shifted procurement funds for the Hawk, PATRIOT Advanced Capability (PAC)-3, and the Navy Area TBMD system to the Services over the course of the FYDP. Recently, USD(A&T) gave BMDO and the Navy authority for the Navy Area TBMD system to proceed to the Engineering and Manufacturing Development (EMD) phase of the acquisition process. The Navy Theater Wide (NTW) TBMD system has been designated as a pre-Major Defense Acquisition Program (MDAP). Current operational capabilities against theater ballistic missile threats have been improved by delivering upgrades to the PATRIOT system and improved BMC4I systems to the CINCs, as well as making TMD a vital part of military exercises.

The Joint Theater Air and Missile Defense Organization (JTAMDO). Perhaps the most significant new initiative has been the formation of the JTAMDO, established in November 1996 by the Vice Chairman of the JCS and USD(A&T) to develop and coordinate Joint theater air and missile defense requirements and efforts, including those for ballistic and cruise missile defenses. The JTAMDO is the single organization within DoD responsible for Joint integrated theater air and missile defense requirements, operational concepts, and architectures. The JTAMDO will coordinate TMD activities with the CINCs and Services, and in the words of Rear Admiral Richard West, BMDO Deputy Director, JTAMDO will “do the operator’s side of the house, to create the operational requirements and the operational architecture . . . necessary to meet the requirement.” BMDO serves as the integration systems architect, with the responsibility of translating JTAMDO-developed requirements into systems architectures, and as the lead R&D and acquisition agency. Additional details are provided in Table 5.7 and in Appendix C (Table C.13).

5.6.3 Counterproliferation Support Program Projects in Active Defense. The Counterproliferation Support Program currently has no projects in the area of active defense.

5.6.4 Active Defense Programs Strongly Related to Counterproliferation. BMDO, Service, and DARPA programs are addressing counterproliferation ACEs in active defense. These programs are described below.

BMDO Programs. BMDO is currently managing several TMD programs, including: i) continuing the development of upgrades to the Army’s PATRIOT PAC-3 system and the Navy’s Area TBMD system; ii) developing and testing the Army’s Theater High Altitude Area Defense System (THAAD); iv) developing the NTW TBMD system; v) conducting Joint Service theater missile defense Demonstration and Validation (Dem/Val) and Program Definition and Risk Reduction acquisition activities; vi) cooperating in international missile defense development programs like the joint U.S.-European Medium Extended Air Defense System (MEADS) and Israel’s Arrow program; vii) developing advanced technologies and supporting innovative science and technology development for missile defense applications; and viii) conducting studies and analyses exploring the offense/defense synergies of counterforce operations against mobile missile systems. BMDO is also managing the development of a National Missile Defense and its supporting technologies.

The first of BMDO’s core programs for near-term deployment is the *Army PAC-3 system* which is being developed in several configurations. Configuration 2 features major software

upgrades to the radar, giving it greater tracking capability, and improvements to communications links. Two of nine PATRIOT batteries have already been equipped with this upgraded system. PAC-3 (Configuration 3) will build on the previous configurations with a more capable hit-to-kill missile and substantial upgrades to its ground radar. The PAC-3 missile will begin low-rate initial production (LRIP) in FY 1998 and be fielded in late FY 1999. The second of the lower-tier systems is the *Navy Area TBMD* system. This program builds on the national investment in AEGIS ships and weapon systems and the Navy SM-2 Block IV missiles now being used for air defense. With software upgrades to the SPY-1 radar, coupled with improved kinematics and fuzing for the SM-2 missile and a blast-fragmentation warhead, this system will be capable of ballistic missile intercepts. With this system, the Navy can bring a TMD capability into a theater without having to deploy forces on land. It will be particularly useful in providing NBC/M protection to debarkation ports, coastal airfields, amphibious objective areas, allied forces ashore, and other high value sites. BMDO plans to field a User Operational Evaluation System (UOES) in FY 1999 with first unit equipped (FUE) in 2001.

The higher altitude or upper-tier portion of the family of systems for active defense features Army and Navy programs that are still in the Dem/Val or Program Definition and Risk Reduction phase of the acquisition cycle and are not due for deployment until after the year 2000. The *Army's Theater High Altitude Area Defense System* will provide an exo-/endo-atmospheric intercept capability that will make it possible to protect broad areas, dispersed assets, and population centers against theater ballistic missiles. Of the many components of this system, the THAAD radar (formerly known as the Ground Based Radar) is a key factor. It is based on state-of-the-art, solid-state, X-band radar technology, and will be interoperable with both existing and future air and missile defense systems. The THAAD interceptor is a single stage booster and kinetic kill vehicle that destroys its targets by colliding with them in a "hit-to-kill" mode. THAAD's BMC4I system will manage and integrate all THAAD components. Seven THAAD flight tests have been conducted since 1995, and, while a successful intercept has not yet been achieved, these tests have been important in integrating the THAAD radar as the system's primary sensor and in developing the overall system for operational deployment. A THAAD UOES prototype (excluding missiles) is currently available for early operational assessment, enabling soldiers to influence the final system design. The current plan calls for making the THAAD UOES prototype available in 1999 for limited use as a contingency capability during a national emergency. FUE (i.e., one battery with an upload of missiles) could occur as early as FY 2005. However, the acquisition status of the THAAD program is being reviewed by USD(A&T).

The *Navy Theater Wide TBMD* system is an upper-tier exoatmospheric active defense system which leverages the Navy Area TBMD program, the AEGIS Weapons System, Standard Missile, and Vertical Launch System. However, the capabilities of all these systems will be upgraded, especially the range and lethality of the Standard Missile, to achieve a depth of fire and defense that can span an entire theater wide region without the need for land bases. It will be capable of intercepting threat missiles in their ascent phase, at apogee, or during descent. Coupled with the lower tier systems, like PAC-3 and the Navy Area TBMD system, the upper tier systems will make possible a layered defense which will significantly improve capabilities to protect friendly forces and allied populations against NBC/M threats. The main objectives of the Navy Theater Wide TBMD program are to increase the range of the system by adding a third stage to the SM-2, Block IVA missiles and to test and integrate a hit-to-kill interceptor. Several potential interceptors,

now involved in concept exploration and technology demonstrations, are under consideration, including the Lightweight Exo-Atmospheric Projectile (LEAP). The first LEAP flight test is scheduled for 1999 and the first intercept test is slated for 2000. The program would then transition to EMD followed by UOES, although no firm dates have been set for these milestones.

The U.S. government has entered into an international cooperative program with Germany and Italy to develop the *Medium Extended Air Defense System*. This system will fill a critical void in the current force structure by providing organic air defenses to land maneuver forces against short and medium range theater ballistic missiles, cruise missiles, UAVs, and fixed and rotary wing aircraft. Additionally, the MEADS netted distributed BMC4I system ensures interoperability in support of Joint and combined operations. Through its Joint TMD program, BMDO is cooperating with the Israeli government in the development of their *Arrow National Defense System*. Much useful data have already been gleaned from a recent series of successful Arrow flight tests. BMDO is also funding the Boost Phase Intercept program in cooperation with Israel to explore the use of armed UAVs to intercept theater ballistic missiles during their ascent phase.

All of the systems discussed above are designed to intercept NBC-armed air and missile systems after they have been launched, but it may be more effective and cheaper to conduct counterforce operations (also referred to as “attack operations” in a TMD context; see Joint Publication 3-01.5, *Doctrine for Joint Theater Missile Defense*, February 1996) against enemy tactical systems supporting launch operations, including mobile launch systems, before the aircraft or missiles can be launched. Counterforce operations offer synergies with defensive operations, further enhancing capabilities to protect U.S. and allied forces. In coordination with the Services, BMDO continues to monitor and sponsor studies and experiments that examine the effectiveness and cost trade-offs between active defense against theater ballistic missiles in flight and counterforce operations against NBC/M delivery systems, like mobile missile launchers (including those deployed in hide sites or in deep underground or hardened shelters).

While these core systems are aimed at countering NBC/M threats in a theater, DoD is also concerned about defending the U.S. homeland from these weapons and their associated delivery systems, and has directed BMDO to manage the *National Missile Defense* program. While NMD was once a technology development effort, it has now been elevated to a deployment readiness program and designated as a major defense acquisition program. Over the next few years, components of an NMD system will be flight tested at the national test range in the Pacific, to include an intercept test of the kill vehicle in FY 1998. The program is designed to enable development of the system in three years and, should the threat warrant it, deploy elements of the system in an additional three years. If deployed, the system will be composed of ground-based interceptors and a ground-based radar along with forward-based early warning radars.

Key BMDO accomplishments since last year's report include several successful live fire tests in which interceptor missiles successfully engaged their targets. These tests include: i) a PATRIOT PAC-3 (Configuration 2) system with Guidance Enhanced Missiles successfully shooting down a SCUD missile, an event that also included a successful integration test of the THAAD and AEGIS radars, the Airborne Surveillance Testbed, and the Cobra Judy radar; ii) demonstration of Navy Area TBMD SM-2 Block IV missile IR seeker and blast-fragmentation warhead functionality by intercepting a Lance ballistic missile target; and iii) three successful

intercepts for the Israeli Arrow program. Other successful tests which did not involve intercepts include: i) the environmental test firing of a SM-2, Block IVA missile which integrated the missile's IR detector dome and radar detectors and tested the dome's operation at various flight temperatures; ii) a TMD Critical Measurements Program test with a Castor IVB booster that carried and then released a crude maneuvering reentry vehicle and penetration aids along with a fly-away sensor that collected signature data on these objects; and iii) releasing a Request for Proposals for a lead NMD systems integrator and drafting an Integrated Deployment Plan for NMD. Additional project details are provided in Table 5.7 below and in Appendix C (Table C.6).

Army PATRIOT PAC-3 RDT&E and Procurement. Procurement of PATRIOT PAC-3 upgrades transitions to the Army in FY 1998. The PAC-3 system is being modified with the Guidance Enhanced Missile upgrade, and software and hardware improvements will give the system enhanced capabilities against both ballistic and cruise missiles. In FY 1998, 52 PAC-3 missiles, 11 PAC-3 launch stations, and 6 radar station modification kits will be procured. In a recent flight test, a PAC-3 system with Guidance Enhanced Missiles shot down a SCUD target missile. RDT&E activities are under way to support development of the Remote Launch Communications Enhancement System, threat simulations, and P3I system testing. Additional project details are provided in Table 5.7 and in Appendix C (Table C.3).

Army Missile Defense Systems Integration and TMD BMC4I Procurement Programs. This program funds systems analysis, studies, and experimentation designed to validate and integrate the four key functions of TMD: active defense, passive defense, counterforce operations, and BMC4I. This Dem/Val and systems integration program develops hardware and software components, doctrinal and procedural solutions, subsystem interface controls, and systems architectures. This program supports the joint U.S./Israeli Nautilus/Tactical High Energy Laser (THEL) ACTD evaluating the effectiveness of high energy lasers to defeat threats posed by Katyusha and similar short range artillery rockets. Completion of the THEL integration and testing demonstration is scheduled for FY 1998. This program also supports the U.S. Army Space and Strategic Defense Command's Missile Defense Battle Integration Center (MDBIC) which is building a flexible linked architecture of pre-existing live, virtual, and constructive simulations in a distributed interactive simulation (DIS)-based architecture to support training, exercises, advanced concepts and requirements development, and military operations associated with TMD, NMD, and space operations. The Army is also providing critical BMC4I systems for TMD, including Joint Tactical Information Distribution System (JTIDS) terminals to ensure multiple platform interoperability. Additional project details are provided in Table 5.7 and in Appendix C (Table C.3).

Navy Active Defense Programs. In February 1997 procurement responsibilities for the Marine Corps Hawk and the Navy Area TBMD programs were transferred from BMDO to the Navy. In January 1997, the Navy Area TBMD system achieved its first intercept of a theater ballistic missile with its modified SM-2 Block IV interceptor. The Navy Area TBMD program was subsequently approved to proceed to EMD by the Defense Acquisition Board (DAB). The NTW Flight Demonstration/AEGIS Leap Intercept Program is scheduled to be reviewed by OSD in April 1997 to determine its appropriate acquisition cycle status. Additional project details are provided in Table 5.7 and in Appendix C (Table C.4).

Marine Corps Hawk Program. The Hawk program declared IOC in the first quarter of 1997. The Hawk system is being upgraded by modifying its TPS-59 radar to improve its effectiveness. The radar completed operational test and evaluation in FY 1996 and initial modification kit production will begin in FY 1997. Kit installation will begin in FY 1998 and be completed in FY 1999. During the same period, improvements will also be made to the Hawk missile to increase its lethality. Key program accomplishments include a series of five successful flight tests in which Hawk missiles engaged and destroyed Lance ballistic missile targets. Additional project details are provided in Table 5.7 and in Appendix C (Table C.4).

The Air Force Airborne Laser Program. The Air Force is developing a Boeing 747 aircraft based high power laser to intercept ballistic missiles in their boost phase. The ABL combines demonstrated state-of-the-art laser, adaptive optics, beam control, and BMC4I technologies into a forward deployed long range TMD boost phase defense platform with “speed of light response” that complements other active defense systems. The program is a legacy of the Airborne Laser Laboratory of the early 1980s and builds on the advancements in laser and optical system technology achieved over the past 15 years. The program has entered the Program Definition and Risk Reduction phase of the acquisition process, and a \$1.1 billion contract was recently awarded to a contractor team to initiate ABL system Dem/Val. A prototype system is under development to demonstrate boost phase defense against theater ballistic missiles in FY 2002. Potential adjunct missions, such as cruise missile defense and air defense of high value airborne assets, are also being analyzed. The goal is to begin fielding the first of seven planned ABL systems in FY 2005 with full operational capability achieved in FY 2008. Key program accomplishments include: i) completion of active missile tracking demonstrations at White Sands Missile Range; ii) demonstration of required laser power levels and chemical efficiency in full scale tests; iii) demonstration of beam control functionality and a multi-beam illuminator concept; and iv) completion of in-flight 747 aircraft vibration tests and wind tunnel tests of the beam director turret. Additional project details are provided in Table 5.7 and in Appendix C (Table C.5).

Air Force Theater Missile Defense (R&D) Program. This program is working to improve the ability to detect, locate, identify, and destroy (or otherwise neutralize) an enemy’s theater missile capability and its supporting infrastructure elements in all phases of theater conflict. It defines improvements to existing BMC4I and counterforce capabilities, develops and evaluates prototype systems, demonstrates modifications during operational concept demonstrations, and coordinates transfer of improvements to operational systems. Key accomplishments include: i) demonstration of data Link-16 range extension and integration of the Link-16 TMD message set on the Airborne Warning and Control System (AWACS) aircraft; ii) development of a methodology for conducting Intelligence Preparation of the Battlespace (IPB), including automated application of the methodology; iii) completion of country studies as part of the IPB process; iv) development of planning tools to assist in deployment of air and missile defense systems and a targeting decision aid for time critical targets; and v) completion of an expert

Table 5.7: Key DoD Counterproliferation Programs in Active Defense

Program/Project Title	Project Description	DoD ACE	Agency	FY 98 Budget [\$M]	PE No.
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Strongly Related CP Programs					
• JTAMDO Support	• Planning, coordination, and oversight of Joint integrated theater air and missile defense requirements, operational concepts, and architecture development	4, 7	Joint Staff	23.100	605126J
• BMDO Programs*	• PATRIOT PAC-3 EMD • Navy Area TBMD System EMD • THAAD System Dem/Val • THAAD System EMD • Navy Theater Wide TBMD System Dem/Val • MEADS Dem/Val • Joint TMD Dem/Val • National Missile Defense Dem/Val • Boost Phase Intercept Dem/Val • Support Technology Applied Research • Support Technology Advanced Concept Devel.	4, 7	BMDO	206.057 267.822 294.647 261.480 194.898 47.956 542.619 504.091 12.885 101.932 147.557	604865C 604867C 603861C 604861C 603868C 603869C 603872C 603871C 603870C 602173C 603173C
• PATRIOT PAC-3 Procurement	• Procurement of PATRIOT PAC-3 system/missile	4, 7	Army	349.100	procurement
• Army PATRIOT PAC-3 RDT&E	• Development of the Remote Launch Communications Enhancement Unit, threat simulations, and P3I testing	4, 7	Army	12.388	203801A
• Army Missile Defense Systems Integration: Dem/Val	• Dem/Val and integration of critical TMD systems • Support joint U.S./Israeli Nautilus/THEL ACTD	4, 7	Army	24.138	603308A
• Army TMD BMC4I Procurement	• Provide JTIDS terminals for platform interoperability in support of TMD	4, 7	Army	20.100	208864C
• Navy Active Defense Programs	• Procurement of the Navy Area TBMD System	4, 7	Navy	15.400	procurement
• Marine Corps Hawk Program	• Procurement of the Hawk Air Defense System	4, 7	Navy	3.475	procurement
• Air Force Airborne Laser Program	• Integration of laser, optical, tracking, and related BMC4I systems into ABL aircraft for demonstration of ballistic missile boost phase defense	4, 7	Air Force	157.136	603319F
• Air Force Theater Missile Defense (R&D) Program	• R&D integration to improve BMC4I and counter-force operations to defeat theater missile capabilities and their supporting infrastructure elements	4, 12, 8, 7	Air Force	29.182	208060F
• Air Force Space Sensor and Satellite Communication Tech.	• Surveillance sensor and threat warning technology RDT&E in support of TMD and NMD	4, 7	Air Force	1.498	603401F
• DARPA Air Defense Initiative	• Technology R&D for low cost defenses against cruise missiles, theater ballistic missiles, and UAVs and for air-directed defense architectures	7, 4	DARPA	18.100	603762E

* See Appendix C, Table C.6, for additional details.

missile tracker prototype. Additional project details are provided in Table 5.7 and in Appendix C (Table C.5).

Air Force Space Sensor and Satellite Communication Technology Program. This program is developing surveillance sensor and threat warning technologies required to support TMD and NMD. Key accomplishments include: i) fabrication and characterization of the first large format (256 x 256 element arsenic-doped silicon) array for IR space sensor applications; ii) demonstration of a two color focal plane array; and iii) fabrication of an IR camera testbed capable of testing large staring arrays. Additional project details are provided in Table 5.7 and in Appendix C (Table C.5).

DARPA Air Defense Initiative. In its Air Defense Initiative, DARPA is pursuing three projects which will provide defense against NBC-armed cruise missiles, theater ballistic missiles, and UAVs. These are the Mountain Top Program, the Low Cost Cruise Missile Defense Program, and the Air-Directed Surface-to-Air Missile Architecture. Key accomplishments include: i) demonstration of Mountain Top surveillance radar technology and transfer of the radar to the Navy for further development; ii) initiation of three low cost cruise missile defense studies; and iii) testing of fieldable space-time adaptable radar processing algorithms which allow rejection of jamming signals and false ground echos. Additional project details are provided in Table 5.7 and in Appendix C (Table C.7).

5.6.5 Near-, Mid-, and Long-Term Milestones for DoD Active Defense Programs.

Figure 5.5 summarizes the time-phased milestones of those active defense programs discussed above and having clearly identifiable acquisition milestones. As born out in the figure, starting with PATRIOT PAC-3 FUE in 1999, significant upgrades in active defense capabilities will occur over the next five to seven years.

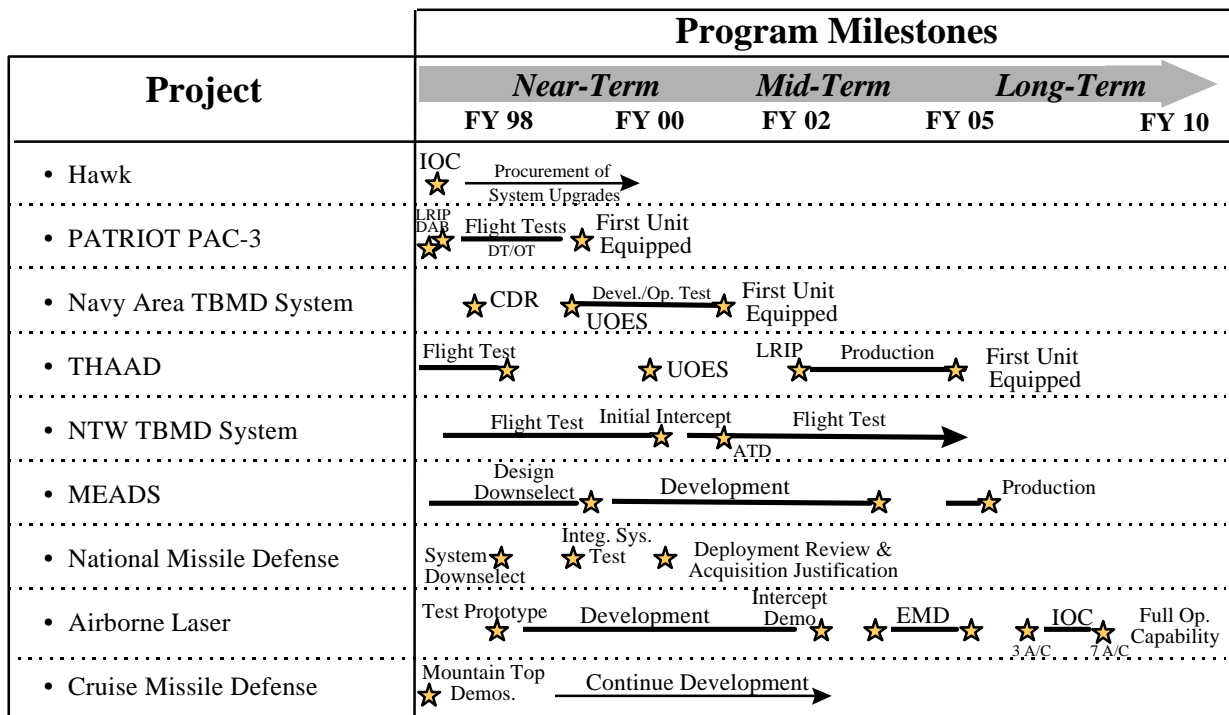


Figure 5.5 Time-Phased Milestones of Active Defense Programs

5.7 Status and Accomplishments of DoD Passive Defense Programs

5.7.1 Relevant Counterproliferation ACEs and DoD Policy Perspectives. DoD supports an extensive NBC passive defense infrastructure to enable U.S. military forces to survive, fight, and win in NBC contaminated environments. An integrated, balanced program is essential to achieve this objective. The Chemical and Biological Defense (CBD) Program oversees and coordinates all DoD efforts in passive defense. U.S. forces must have aggressive, realistic training and defensive equipment that allows them to avoid contamination, and, where contamination cannot be avoided, they must be able to protect themselves, decontaminate, and sustain operations throughout the battlespace environment. They must also have the capability to provide effective medical casualty treatment and management. To address these needs, DoD is supporting R&D and acquisition programs developing: i) systems to detect, identify, characterize, and provide warning of CW/BW agents (DoD ACE priorities 1 and 9); ii) individual and collective protection gear (DoD ACE priority 9); iii) methods to advance the speed and efficiency of CW/BW agent decontamination (DoD ACE priority 9); and iv) a broad array of CW/BW medical defense RDT&E and casualty management and treatment activities (DoD ACE priority 9). In addition to these efforts, DoD is pursuing, through the CBD Program, efforts to increase its BW vaccine production capacity, stockpile vaccine supplies, and develop a broader spectrum of new and improved BW vaccines and other medical countermeasures for CW/BW agents (DoD ACE priorities 10 and 9). In cooperation with the CBD Program, the Counterproliferation Support Program is continuing to leverage ongoing CBD programs to accelerate the fielding of critical systems and technologies in BW detection and early warning.

5.7.2 New DoD Initiatives in Passive Defense. To expedite the fielding and improve the capabilities of BW agent detection and warning, one ACTD is under way, another is under development, and a new developmental BW detection system is being designed. They are summarized below.

The Air Base/Port Bio Detection ACTD. The purpose of this ACTD is to expedite the fielding of an interim capability to provide rapid automated BW attack detection and warning to high value fixed sites such as ports and airfields. The ACTD is managed by the JPO-BD in conjunction with the CBD Program and sponsored by the CINCs of the U.S. Central Command (CENTCOM) and USPACOM. The BW agent detection system will be based on the Navy's deployed Interim Biological Agent Detection (IBAD) system supplemented with modules for detecting generic biological material, location reporting, and measuring meteorological conditions. In addition to the IBAD-based BW detection system, the following residuals or "leave behinds" will be provided to the CINCs: i) an integrated command and control system (involving prototype JWARN components) to assist base personnel in the rapid assessment, warning, and dissemination of BW attack data; ii) oral-nasal respirators providing protection from re-aerosolized BW agents without the stresses associated with full face protective masks; iii) decision aids and procedures for site decontamination; and iv) procedures for determining when it is safe to remove protective gear. With this system, warning of a possible BW attack can be transmitted to a central command post in about 10 minutes after the initial detection. Testing of a small scale detector network prototype is under way and full scale testing of a complete network and other residual equipment will be completed this Summer. Full scale deployment of ACTD products to CENTCOM and PACOM will begin in FY 1998.

The Joint Biological Remote Early Warning System (JBREWS) ACTD. This ACTD is designed to expedite the fielding of BW battlefield and fixed site detection and early warning systems and develop doctrine and tactics for their use. The ACTD effort is being managed by the JPO-BD with oversight provided by the DATSD(NCB)(CP). CINC sponsors are CINC EUCOM and CINC CENTCOM. Other key participants include the Army's Chemical and Biological Defense Command (CBDCOM), DARPA, DOE, and the Naval Research Laboratory. By using remote BW detection systems, the JBREWS concept will enable improved warning and more timely dissemination of BW threat data to U.S. forces. Man emplaced, UAV-based, and artillery delivered sensor and support systems will be evaluated as will active laser detection systems. A draft Management Plan and baseline cost estimate have been completed, and a JBREWS ACTD systems study is under way. ACTD field demonstrations with the CINCs will commence in FY 2000, along with EMD transition. System element production is scheduled to start in FY 2003.

The Joint Biological Point Detection System (JBPDS). JBPDS is the developmental system that will replace existing and deployed BW detection systems, like the Biological Integrated Detection System (BIDS), IBAD, and the Air Base/Port ACTD interim detector systems. It will provide BW agent detection capabilities for all the Services and throughout the battlespace. The BW detection suite will consist of four functional elements: i) the trigger for real-time detection of significant changes in ambient aerosol levels; ii) the collector for BW sample collection to enable more detailed analysis; iii) the detector for broad characterization of sampled biological material (e.g., bacteria, spore, protein, etc.); and iv) the identifier for identification of suspected BW agents. JBPDS integrates these functionalities into an automated system providing Joint Service interoperability. This Joint Service acquisition program is managed by the JPO-BD in conjunction with the CBD Program. An EMD contract will be awarded in FY 1997, and production is scheduled to start in FY 2000, with FUE scheduled for FY 2001.

5.7.3 Counterproliferation Support Program Projects in Passive Defense. The Counterproliferation Support Program is focusing its passive defense activities on developing and deploying standoff BW detection and early warning capabilities, including conducting the JBREWS ACTD. The Counterproliferation Support Program is also developing and integrating advanced technologies in support of the prototype NBC Joint Warning and Reporting Network (JWARN). The Air Base/Port Bio Detection ACTD is being used as a vehicle to expedite JWARN development. The Counterproliferation Support Program continues to support the accelerated fielding of both an advanced eye safe infrared (IR) lidar (i.e., an improved Long Range Biological Standoff Detection System, LR-BSDS) to provide long range battlefield detection of aerosol clouds indicative of BW use and the ultraviolet violet (UV) lidar system (i.e., the Short Range Biological Standoff Detection System, SR-BSDS) for standoff discrimination of BW (versus non-BW) agents. Two prototype LR-BSDS units will be fielded by September 1997. The SR-BSDS transitions to the JBREWS ACTD in FY 1998 as a candidate technology for evaluation. The Counterproliferation Support Program is also continuing the development of technologies to support near-term fielding of advanced BW agent detection, including fiber optic wave guide (FOWG) biosensors, mass spectrometers, flow cytometers, and detectors employing multispectral UV fluorescence spectroscopy.

Key accomplishments since last year's report include: i) receiving the commitment of CINC EUCOM and CINC CENTCOM to support the JBREWS ACTD and preparation of a draft ACTD management plan and cost estimate; ii) delivery of 30 JWARN prototype systems to USEUCOM; iii) demonstrating JWARN and Air Base/Port Bio Detection ACTD integration; iv) restructuring the eye safe LR-BSDS program and system design to compensate for reduced funding, demonstrating full laser power, and fabricating 2 prototype systems; v) completion of a system design review for the SR-BSDS prototype and initiation of component field testing; vi) successful testing of micro UV laser fluorescence biosensors at Joint Field Trials III; vii) fielding of portable, ruggedized prototype FOWG biosensors for use by the Chemical Biological Incident Response Force (CBIRF) and SOF; and viii) conducting biological background and interferent sampling at several field sites to improve BW agent detection capabilities. Additional details of the Counterproliferation Support Program passive defense projects are provided in Table 5.8 below and in Appendix C (Table C.1).

5.7.4 DoD's Chemical and Biological Defense Program. All DoD chemical and biological defense programs are coordinated and integrated within a single office in OSD, consistent with the requirements of 50 U.S. Code, Section 1522. The ATSD(NCB) is the designated focal point within OSD for the CBD Program. This has been a critical tool for ensuring the elimination of redundant programs, focusing funds on program priorities, and enhancing readiness. To date, there has been a consolidation of funding for R&D and initial procurement programs for CW/BW defense (along with some nuclear/radiological passive defense programs). O&M accounts remain with the Services. Significant progress has been made in the development of Joint training, doctrine development, and requirements generation. Modernization and technology plans have been developed which should begin to show savings and true integration of efforts among the Services. Detailed descriptions of the management, plans, accomplishments, and systems under the CBD Program can be found in its latest annual report to Congress entitled *Department of Defense Nuclear, Biological, and Chemical (NBC) Defense Annual Report to Congress*, published in March 1997.

All R&D and acquisition programs within the CBD Program are structured within six Program Elements (PE) for Basic Research, Applied Research, Advanced Technology Development, Demonstration/Validation (Dem/Val), Engineering and Manufacturing Development (EMD), and management support. Procurement funds have also been consolidated. Highlights of key programs strongly related to counterproliferation within each of these program elements are described below. Additional program details, including FY 1998 budget profiles, are provided in Table 5.8 below and in Appendix C (Table C.2).

CW/BW defenses are conducted within the framework of three principles: i) contamination avoidance, ii) protection, and iii) decontamination. These principles provide the basis for an integrated and balanced CW/BW defense program. Contamination avoidance is the highest priority area and consists of capabilities and procedures to: detect, identify, and warn forces of CW/BW threats; enable commanders to determine the appropriate protective posture to assume; and distribute the necessary information so that U.S. forces can avoid contamination. When contamination cannot be avoided, protection makes it possible to survive, fight, and win in a contaminated environment. Protection consists of three elements: individual protection, collective protection, and medical programs. Finally, decontamination provides critical capabilities to allow

the sustainment of operations in a contaminated environment. This framework is detailed in Joint Publication 3-11, *Joint Doctrine for Nuclear, Biological, and Chemical (NBC) Defense*. Key accomplishments in each commodity area are described in what follows.

Contamination Avoidance. Multiple systems are either under development, in production, or have been fielded for early warning, point detection, and warning and reporting of CW/BW threats. Over the past year, there have been several accomplishments in contamination avoidance R&D and acquisition programs.

Science and Technology Base - Basic Research, Applied Research, and Advanced Technology Development. *Basic Research* efforts include coordination and consolidation of a mass spectrometric study of biomarkers having potential utility in future BW detectors and investigation of techniques for generic detection of microbial toxins. *Applied Research* efforts include: i) evaluation of BW agent local warning detection technologies such as deoxyribonucleic acid (DNA) probes, electrospray mass spectrometry, planar wave guides, flow cytometry, and other advanced technologies to support early warning of BW agents; ii) field testing of a tunable UV laser standoff breadboard prototype detector; and iii) development of technologies and databases for multispectral UV fluorescence detection and discrimination of BW agents in realistic battlespaces containing natural and man-made interferents. Key *Advanced Technology Development* projects include demonstrated technologies in the areas of wide area detection using chemical imaging sensors, low level atmospheric monitoring using a mini Chemical/Biological Mass Spectrometer (CBMS), and small lightweight detectors using ion mobility spectrometry.

Demonstration/Validation. Key programs include: i) the Lightweight Nuclear Biological Chemical Reconnaissance System (LNBCRS), which provides unit field commanders with real-time data that can be used to assess the battlefield for NBC hazards while on the move; ii) the Joint Service Lightweight Standoff Chemical Agent Detector (JSLSCAD), which provides chemical agent detection and mapping for CW agent clouds; and iii) technology evaluation of the Joint Chemical Agent Detector (JCAD) addressing Joint Service CW/BW defense requirements.

Engineering and Manufacturing Development. There are several key programs in EMD that promise to offer greatly improved capabilities in the near term for contamination avoidance. They include: i) JWARN, which automates NBC warning and reporting throughout the battlefield and links digital data into existing C3 systems; ii) the CBMS, which identifies collected CW/BW agents and is a potential component for the BIDS Pre-Planned Product Improvement (P3I) system, and the FOX NBC Reconnaissance System (NBCRS); iii) JCAD, which is developing a combined portable CW monitor and small point CW detector for aircraft, shipboard, and individual soldier applications; iv) the Shipboard Automated Liquid Agent Detector (SALAD) for CW detection; v) the Shipboard Chemical Agent Monitor – Portable (SCAMP); and vi) the Joint Service LNBCRS.

Procurement. The BIDS Phase II P3I system will provide technology insertion from concurrent development efforts to upgrade the Phase I Non-Development Item (NDI) BIDS and make possible the ability to detect eight BW agents, provide increased automation for detecting BW agents, and enable computerized integration of detector outputs. Procurements in FY 1998 also include the Improved Chemical Agent Monitor (ICAM), the Automatic Chemical Agent Alarm (ACADA), FOX NBCRS modifications, the AN/UDR-13 Pocket Radiac (Radiation Detection,

Indication, and Computation) nuclear radiation detector, and the Improved Point Detection System (IPDS) for shipboard use.

Protection. Over the past year, there have been several accomplishments in all phases of R&D and acquisition programs for individual and collective protection.

Science and Technology Base - Exploratory Development. Key tech base efforts to improve protection include: i) investigating enhanced protection technologies for masks; ii) continued integration of advanced mask concepts into 21st century soldier systems; and iii) investigating technologies for a lightweight, extended wear half-face mask for improved BW protection.

Demonstration/Validation. The key Dem/Val project for improving collective protection is the Advanced Integrated Collective Protective System (AICPS) which integrates new NBC filtration technologies with environmental controls and power generation components for tactical and combat systems. AICPS is designed to be integrated into multiple configurations to provide collective protection for a variety of tactical systems.

Engineering and Manufacturing Development. Key EMD projects for improving protection include development of the M45 Aircrew Protective Mask (ACPM) which provides rotary wing air crews with a less burdensome respiratory protection system, the AICPS, the M40 P3I Mask, and the M20 P3I Collective Protection System. One of the major programs to be fielded in the near-term is the Joint Service Lightweight Suit Technology (JSLIST) individual protective garment. JSLIST is a Joint Service effort to field a common chemical protective ensemble (i.e., suit, boots, and gloves) that provides adequate chemical protection, reduced heat stress, full compatibility with all interfacing equipment, longer wear, launderability, a single technical data package and manual, a split issue feature to improve fit and reduce inventory, and flame retardancy. JSLIST promotes commonality and standardization to maximize the effectiveness of resources and eliminate redundancy among the Services.

Procurement. The key protection procurement program for FY 1997 is the fielding of the M40/M42 standard issue NBC protective masks.

Medical Programs. Over the past year, there have been several accomplishments in the development of medical countermeasures against CW/BW agents. Medical countermeasures fall into three basic categories: prophylactic (preventative), therapeutic (post-exposure), and diagnostic. Key accomplishments in prophylactic countermeasures include: i) the continued development of advanced vaccines for anthrax, botulinal toxoids, ricin toxoid, Venezuelan equine encephalitis (VEE), and plague; ii) studies of biological scavengers for nerve agents; and iii) cyanide pretreatments. Key accomplishments in therapeutic countermeasures development include: i) continued development of a reactive topical skin protectant for protection against nerve and mustard agents; ii) development of a nerve agent multichambered auto-injector (to replace the multiple injections currently required); and iii) animal toxicology studies for cyanide pretreatments. The key accomplishment for diagnostic countermeasures is the continued development of a forward deployable diagnostic kit which will allow immediate diagnosis of BW-related casualties in the field.

The Joint Vaccine Acquisition Program. DoD has made significant progress in the acquisition of vaccines and related medical products for BW defense. After Operation Desert Shield/Desert Storm, the Army conducted several studies on different approaches for ensuring an adequate industrial base for the production of vaccines against BW agents. An initial study concluded that a government-owned, contractor-operated facility was the best approach. However, a 1994 cost analysis demonstrated that a dual use contractor-owned, contractor-operated facility was significantly less expensive based on net present value. Industry responses, obtained from a survey and two draft Requests for Proposal (RFP), indicated that industry's main concern focused on receiving the long-term commitment from the U.S. Government necessary to support the scientific efforts required for vaccine licensure by the Food and Drug Administration (FDA). While there may be some deficiency in manufacturing capability for one vaccine, most production requirements can be met with existing facilities. Based on industry responses and government studies, a solid acquisition approach, the Joint Vaccine Acquisition Program (JVAP), was developed. As directed by the Deputy Secretary of Defense, the JVAP will use a prime systems contractor to manage and execute advanced vaccine development, FDA licensure, production, storage, and testing of 18 new BW vaccines that have been discovered through DoD-sponsored research. A final RFP was released for the prime systems contract, and multiple offerors have submitted responsive proposals. The anticipated date of award is June 1997.

An FDA licensed anthrax vaccine is available commercially from the Michigan Biologic Products Institute. Government studies indicate that it confers excellent protective immunity against aerosolized anthrax spores. Production of this vaccine has been ongoing since Operation Desert Shield/Desert Storm, and the DoD-prescribed stockpile level will be completed in FY 1997. Additional efforts are being sponsored by the DoD to obtain the requisite scientific data to support a license amendment request to the FDA for a reduced immunization schedule. Another BW vaccine administered to U.S. forces during Operation Desert Shield/Desert Storm was for botulinum toxoid (pentavalent). This vaccine is not FDA licensed, although it has been used for several decades to protect laboratory workers and has an excellent safety record. Efforts are ongoing to collect data on this vaccine and develop a package demonstrating product safety and efficacy for FDA licensure. After reviewing initial data, an FDA advisory council issued recommendations providing clear direction to DoD and the manufacturer for licensing this vaccine.

Decontamination. Over the past year, there have been several accomplishments in decontamination technology development programs.

Science and Technology Base - Exploratory Development and Advanced Technology Development. Research continues in using enzymatic technology to accomplish CW decontamination. Efforts also focus on developing decontamination approaches for sensitive (e.g., electronic) equipment.

Engineering and Manufacturing Development. The key EMD projects are the Modular Decontamination Systems (MDS) and development of a sorbent decontaminant, which may provide a non-aqueous replacement to the current decontaminant (denoted as DS2) and, by reducing the need for water, considerably reduce the logistics burden associated with current decontamination methods.

Chemical and Biological Defense - Management and Support. The primary program supported within this element is the Joint Chemical/Biological Contact Point and Test Program located at Dugway Proving Ground, Utah. This program provides assessments, laboratory analyses, and field tests on a wide variety of equipment that has been fielded or is in production. These activities provide input to the Services for development of doctrine, policy, training procedures, and feedback into the RDT&E cycle. Accomplishments include six assessments, three field trials, and two laboratory tests evaluating systems performance in a CW environment. Funding is also provided under this program for management support for the overall integration and coordination of the CBD Program. Activities include: Joint Service requirements, training, and doctrine development by the Joint Service Integration Group; Joint Service modernization planning; development of a Joint POM and associated budget; and Joint R&D and acquisition planning by the Joint Service Materiel Group.

The Joint Program Office for Biological Defense. The JPO-BD was established to provide centralized management of specified BW defense acquisition programs. JPO-BD-managed projects include: i) procurement of the BIDS NDI and P3I systems, the LR-BSDS NDI and P3I systems, and the IBAD system; ii) development of the JBPDS and the Air Base/Port Bio Detection ACTD; and iii) the JVAP. The JPO-BD is working with the Counterproliferation Support Program in developing improved capabilities for early warning of BW attack, including development of the eye safe LR-BSDS P3I upgrade, adapting and developing point BW agent detectors for remote/early warning detection applications, and planning and developing the JBREWS ACTD to expedite the fielding of these systems. It is also working with DATSD(NCB)(CP) to develop the 911-BIO ACTD which involves adapting passive defense technologies to BW consequence management applications (see Section 8.3).

CBD Program FY 1998 Procurement Plans. The FY 1998 procurement plan calls for the continued fielding of NBC passive defense equipment along with initial procurement of several improved passive defense systems and components.

Within the *contamination avoidance* mission area a number of procurement activities are planned. Procurement for ICAM, a radically improved version of the already fielded Chemical Agent Monitor, continues under a multi-year contract. Procurement for the ACADA will continue. The ACADA provides, for the first time, a point detection capability to detect blister agents. It also provides improved sensitivity and response time, interference rejection, and a programmable capability for all known CW threat agents. FY 1998 funding continues modifications to the FOX NBCRS, which include added capabilities for standoff CW agent detection and communications links to the digital battlefield. Procurement of the AN/UDR-13 Pocket Radiac, which provides the first ever capability to both detect and indicate prompt and residual radiation doses received by troops, continues in FY 1998. Initial procurement for two new and improved CW detection systems for naval surface ships will continue in FY 1998. The IPDS replaces the older Chemical Agent Point Detection System and provides expanded point detection of CW vapor agents, including blister agents. SALAD provides shipboard detection of liquid CW agents. Funding is also provided to produce 28 BIDS P3I systems in FY 1998 to provide an improved detection and identification capability of BW agents within a theater of operations.

Within the *individual protection* mission area, a number of procurement activities are planned. The M40A1 protective masks procured with FY 1998 funding will allow continued replacement of the aging masks currently in the field. FY 1998 funding also procures additional M41 Protection Assessment Test Systems (PATs) that ensure proper mask fit and functionality. FY 1998 procurement funding initiates the Army purchase of a new aircrew mask, the M45 ACPM. This mask radically improves flight safety and provides full compatibility with night vision goggles and weapon sighting systems while improving aircrew comfort. Funding is provided for continued procurement of the Chemical/Biological Respiratory System which is a new aircrew respiratory system for Navy and Marine Corps tactical rotary wing and land based fixed wing aircraft. Funding for the Joint Service Protective Clothing program continues in FY 1998 and includes full rate production of the JSLIST protective garment, the Explosive Ordnance Disposal (EOD) ensemble, and the Fire Fighting Ensemble (a modified version of JSLIST). Procurement of the Aircrew Eye/Respiratory Protection (AERP) mask, a second generation CW/BW oxygen mask, begins again in FY 1998.

Within the *collective protection* mission area, FY 1998 funding supports continued procurement of the Chemical Biological Protective Shelter (CBPS), a highly mobile, self-contained collective protection system which can provide a contamination-free working area for medical and other selected units.

5.7.5 Other DoD Passive Defense Programs Strongly Related to Counter-proliferation. The CBD Program is the focal point for Joint Service passive defense programs. DARPA BW defense R&D programs and DSWA and Navy acquisition programs in nuclear weapons effects, safety, and survivability also contribute to the counterproliferation ACEs in passive defense. These programs are described below.

DARPA BW Defense Program. As one of the major programs conducted under its Defense Science Office, DARPA is pursuing the demonstration and development of BW defense capabilities. The BW Defense Program is developing advanced point detectors for BW agents and extending its combat informatics program to include BW defense. The DARPA program is developing miniaturized detectors (e.g., on a electronic chip) capable of unattended operation that reduce false alarms to a minimum. The BW Defense combat informatics thrust is developing the capability to deliver information about BW treatment protocols directly to medics in the field and provide BW casualty information to medical and field commands. In addition, DARPA is developing BW medical countermeasures emphasizing multi-agent approaches. Efforts include demonstrating the feasibility of using modified red blood cells to eliminate pathogens from the blood and preliminary exploration of approaches for using stem cells as a vehicle for therapeutic use. Key accomplishments include: i) deposition of BW simulant antibodies on a chip using photolithography and testing of a multiple chip stamping device; ii) development of a medical protocol software tool for BW medical response training and testing of an anthrax version in the COMFEX 96 field exercise; and iii) demonstration of a million-fold reduction of virus in the bloodstream using modified red blood cells. Additional project details are provided in Table 5.8 and in Appendix C (Table C.7).

Under an MoU with ATSD(NCB), DARPA works closely with the Counterproliferation Support Program and the CBD Program in its BW defense efforts. Consistent with the FY 1997

NDAA (Section 228), DARPA's BW Defense Program is not consolidated into the CBD Program but exists instead under separate program elements, and, beginning in FY 1998, it will no longer be incorporated into the CBD Program management and oversight structure.

DSWA Nuclear Survivability Programs. DSWA has two programs to ensure the survivability of weapons systems in a nuclear environment: i) the Test and Simulation Technology Program which provides simulators and simulator technology to validate weapons systems operability in nuclear environments; and ii) the Weapons System Operability Program which provides force survivability assessments against nuclear weapons effects and develops nuclear hardened electronic components for military use. Key accomplishments over the past year for the Test and Simulation Technology Program include: i) demonstration of the technologies and completion of facilities for a new x-ray simulator (known as DECADE) to be located at the Arnold

Table 5.8: Key DoD Counterproliferation Programs in Passive Defense

Program/Project Title	Project Description	DoD ACE	Agency	FY 98 Budget [\$M]	PE No.
<u>CP Support Program</u>					
• JBREWS ACTD	• Accelerate fielding of warfighting capabilities for remote detection, identification, characterization, and early warning of BW agent attacks	1, 9, 8	JPO-BD	17.770	603884BP
• Eye Safe LR-BSDS for BW Detection	• Accelerated deployment of airborne eye safe IR lidars for battlefield BW aerosol detection and track	1, 9	JPO-BD Army	13.744	603884BP
• JWARN Demonstration and Integration	• Demonstrate technology to integrate and communicate NBC hazard information	1, 9	JPO-BD	1.000	603384BP
• BW Detection Advanced Technology Development	• Demonstration and rapid fielding of selected BW man-portable and UAV-integrated detectors for remote detection and characterization of BW agents	1, 9	JPO-BD DARPA NRL	6.845	603384BP
<u>Strongly Related CP Programs</u>					
• Chemical and Biological Defense Program*	• RDT&E and procurement of systems and equipment for NBC agent detection and warning, individual and collective protection, medical response (including vaccine R&D), and decontamination	9, 1, 10	ATSD (NCB) Services JPO-BD	421.335	601384BP 602384BP 603384BP 603884BP 604384BP 605384BP procurement
• BW Joint Vaccine Acquisition Program (part of the CBD Program)	• Advanced Development, Dem/Val, and procurement to meet DoD BW vaccine production and stockpile needs	10	JPO-BD Army	64.502	603384BP 603884BP 604384BP procurement
• DARPA BW Defense Program	• Basic research to develop and demonstrate technologies that will minimize impact of BW agents on future military operations	1, 9	DARPA	61.600	602383E
• DSWA Test and Simulation Technology	• Simulators and simulator technology to validate weapon systems operability in nuclear environments	9	DSWA	20.650	602715H
• DSWA Weapon System Operability Program	• Force survivability assessments against nuclear weapons effects based on test results	9, 11 4, 7	DSWA	7.380	602715H
• Navy Radiac Program	• RDT&E and procurement of radiation detection and monitoring equipment for a variety of applications	9	Navy	3.030	603542N

* See Appendix C, Table C.2 for additional information.

Engineering Development Center; and ii) consolidation of radiation test facilities for more efficient operation. Key accomplishments in the Weapon System Operability Program since last year's report are: i) completion of an operability assessment for U.S. Space Command's (USSPACECOM) tactical warning and attack assessment (TW/AA) system; ii) completion of a quantitative assessment of non-ideal airblast weapons effects for the Army Chemical and Nuclear Agency; iii) development of nuclear hardened high integration density memory chips; and iv) demonstrated hardening of optical imaging electronics at low temperature. Additional project details are provided in Table 5.8 and in Appendix C (Table C.8).

Navy Radiac Program. This program provides RDT&E and procurement for radiation detection and monitoring equipment for Navy and Marine Corps use, including nuclear power, medical safety, weapons safety, radiography, and EOD applications. Key accomplishments include production of the Multifunction Radiac and an EOD dosimeter, initiation of low rate initial production for a laser dosimeter, and transition to EMD for the Underwater Radiac. Additional project details are provided in Table 5.8 and in Appendix C (Table C.4).

5.7.6 Near-, Mid-, and Long-Term Milestones for DoD Passive Defense Programs.

Figure 5.6 summarizes the time-phased milestones of those passive defense programs discussed above and having clearly identifiable acquisition milestones. Several key systems across the

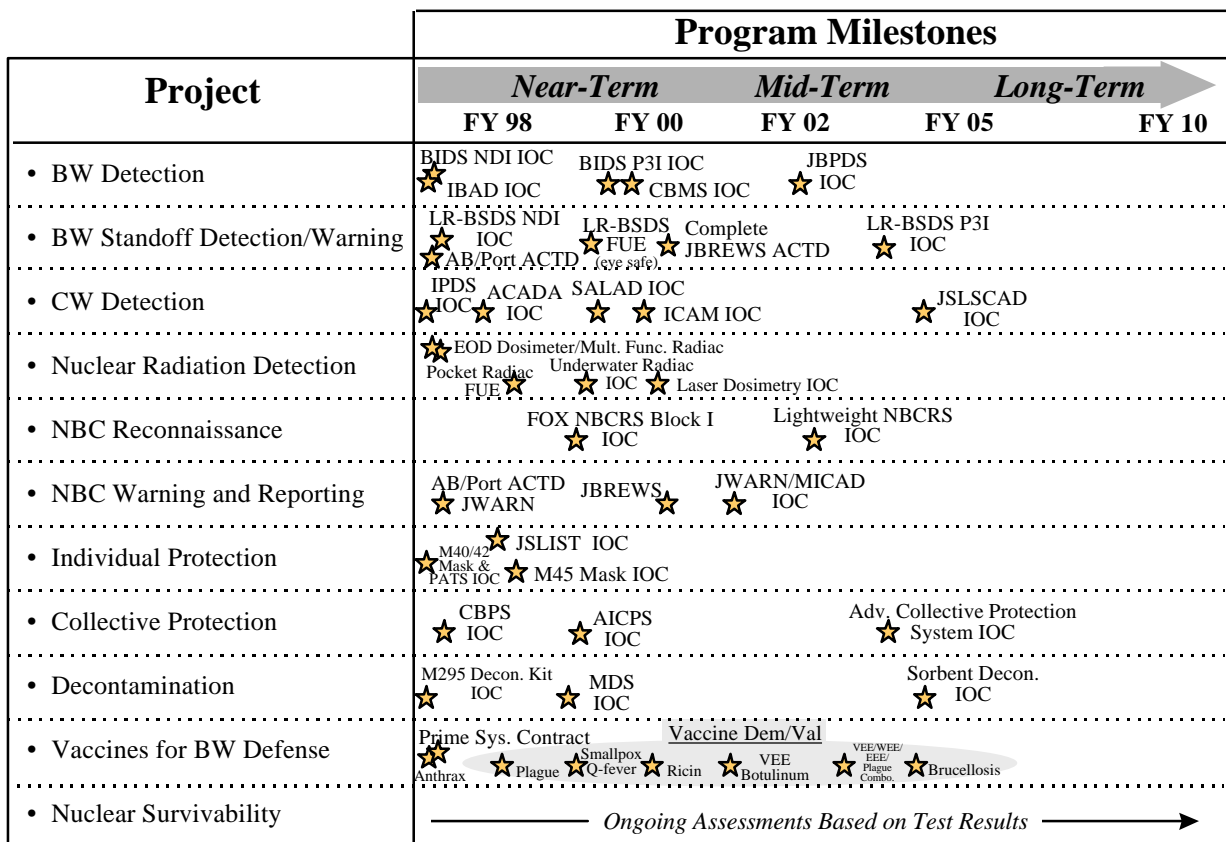


Figure 5.6 Time-Phased Milestones of Passive Defense Programs

passive defense spectrum will achieve IOC by FY 2000 leading to a significant improvement in passive defense capabilities. An impressive array of BW defense vaccines will also have reached the Dem/Val stage of development.

5.8 Summary of DoD's Counterproliferation Response

Table 5.9 summarizes DoD's response to the counterproliferation ACEs by matching selected activity and program accomplishments to the primary ACE priority they address.

Table 5.9: DoD's Response to the Counterproliferation ACEs

DoD ACE Priority	Selected Accomplishments in DoD Counterproliferation Programs
1. Detection, Identification, and Characterization of BW Agents	<ul style="list-style-type: none"> Activated an Army Company equipped with the Biological Integrated Detection System Interim Biological Agent Detector fielded on selected surface ships deployed to high threat areas Accelerated development of advanced early warning BW agent detection systems, including the LR-BSDS and the JBPDS Continuing the Air Base/Port Bio Detection ACTD and initiation of the JBREWS ACTD
2. Detection, Characterization, and Defeat of NBC/M Facilities with Minimal Collateral Effects	<ul style="list-style-type: none"> Conducted integrated sensor, weapon, and targeting tool field tests for NBC/M and underground facility defeat and collateral effects mitigation as part of the Counterproliferation CP1 ACTD Initiated the follow-on Counterproliferation Counterforce CP2 ACTD Agent defeat weapons system concepts collected from industry and DoD/DOE labs for evaluation
3. Detection, Characterization, and Defeat of Underground Facilities with Minimal Collateral Effects	<ul style="list-style-type: none"> Technical evaluation of hard and deeply buried target defeat/neutralization concepts submitted by industry and the DoD/DOE labs See ACE #2 entries above
4. Theater Ballistic Missile Active Defense	<ul style="list-style-type: none"> Theater ballistic missile defense procurement transitioned to the Services; JTAMDO established Successful flight tests for PATRIOT PAC-3/Guidance Enhanced Missile, Hawk, Navy Area Theater Ballistic Missile Defense, and the Israeli/BMDO Arrow programs Completed 7 Theater High Altitude Area Defense system flight tests Airborne Laser boost phase defense system entered Program Definition and Risk Reduction phase; contract issued to industry team to initiate system Dem/Val Completed MoU with European partners for MEADS project definition and validation National Missile Defense elevated to deployment readiness program, RFP for lead systems integrator released, and an Integrated Deployment Plan being drafted
5. Support for Special Operations Forces and Defense Against Paramilitary, Covert Delivery, and Terrorist NBC Threats	<ul style="list-style-type: none"> Continued development of specialized technologies and equipment prototypes to assist SOF and Explosive Ordnance Disposal teams in countering CW/BW threats Continued forward deployment of specialized equipment to enhance readiness sustainment Enhanced coordination of Joint Service exercises and readiness sustainment activities Formed organizational structure and initiated facility assessments to enhance U.S. force protection
6. Provide Consequence Management	<ul style="list-style-type: none"> Established the Marine Corps Chemical Biological Incident Response Force Initiated planning and development of the Consequence Management 911-BIO ACTD Integrated consequence management training for state and local First Responders
7. Cruise Missile Defense	<ul style="list-style-type: none"> Demonstration of Mountain Top surveillance radar technology and transfer to the Navy for further development; initiation of low cost cruise missile defense studies Technology sharing and synergy with ballistic missile defense programs
8. Collection, Analysis, and Dissemination of Actionable Intelligence to Counter Proliferation	<ul style="list-style-type: none"> See the Intelligence Annex to this report
9. Robust Passive Defense to Enable Sustained Operations on the NBC Battlefield	<ul style="list-style-type: none"> Continued deployment of critical NBC detection and warning, individual and collective protection, and decontamination systems for use throughout the battlespace Continuing advances in CW/BW medical defense RDT&E
10. BW Vaccine RDT&E and Production to Ensure Stockpile Availability	<ul style="list-style-type: none"> Contract proposals for prime systems contractor being evaluated; award expected in FY 1997 Continued production of anthrax vaccine to meet DoD stockpile needs in FY 1997; screened several BW vaccines for safety and efficacy; extensive vaccine RDT&E activities under way
11. Target Planning for NBC/M Targets	<ul style="list-style-type: none"> User acceptance of integrated target planning and weaponeering tools by CINC USEUCOM for use in Bosnia as part of Operation Joint Endeavor
12. Prompt Mobile Target Detection and Defeat	<ul style="list-style-type: none"> Development of a foliage penetrating radar and other sensors to defeat camouflage, concealment and deception; new capabilities for near real-time exploitation of wide area imagery Target recognition algorithm demonstration as part of DARPA's Semi-Automated Imagery Processing ACTD Demonstrated operational utility of C4I systems for rapid dissemination of intelligence to users
13. Detection, Tracking, and Protection of NBC/M and NBC/M-Related Materials and Components	<ul style="list-style-type: none"> Deployment of prototype Specific Emitter Identification System for identifying ships at sea suspected of transporting NBC/M or related materials; fleet integration under way
14. Support Export Control Activities of the U.S. Government	<ul style="list-style-type: none"> Reviewed over 18,000 export license application for military and dual-use technologies Enhanced the "Wassenaar Arrangement", a new multinational export control framework
15. Support Inspection and Monitoring Activities of Arms Control Agreements and Regimes	<ul style="list-style-type: none"> Continued inspection, monitoring, and escort support for nuclear weapons arms control treaties Helping Ukraine, Belarus, and Kazakhstan to become non-nuclear weapons states Eliminated 64 SLBM launchers, dismantled 81 ICBMs, dismantled 20 heavy bombers, and sealed 59 nuclear weapons test tunnels and bore holes in FSU states Transitioned over 15,000 FSU scientists and engineers formerly employed in NBC weapon production to more peaceful civilian employment Streamlined management of R&D programs under DSWA to improve CTBT implementation Continued development of a global continuous threshold monitoring network and data fusion

	knowledge base for CTBT verification • Technology R&D for CW/BW arms control treaty implementation, monitoring, and verification
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